

First-Quarter Production Should Exceed that of 1933

Improved design is counted on to outweigh possible effects of higher prices and lower used car allowances

MOTOR vehicle production in the first quarter of the new year, according to present indications, will run substantially ahead of the 368,000 units manufactured in the similar 1933 period. While January production is off to a slow start due to delays in getting new model programs under way, barring further labor troubles, cars should begin to roll off assembly lines in substantial quantities during the latter half of the month.

With the economic horizon so circumscribed by uncertainties, trying to predict what the year as a whole will bring is more than ordinarily hazardous. Nevertheless, within the industry the sentiment seems to be quite general that the forward movement which began following the bank holiday last spring will continue, with the result that the industry in 1934 will show a gain for the second successive year.

The major factor in the situation is, of course, the trend of business generally, but much depends on the public's reaction to this year's somewhat higher new

car prices and somewhat lower used car allowances. What this reaction will be constitutes a question for which the industry anxiously awaits an answer. It seems likely, however, that the new cars themselves, with their manifold improvements, should do much to offset these elements of sales resistance. In addition, some manufacturers at least are taking steps to reduce the spread between list and delivered prices, which reductions will cancel out some of the list price increases so far as the public is concerned.

The year just ended gives striking evidence of the sensitivity of automotive profits to volume increases. A gain of 22 per cent in dollar volume was sufficient to transform a substantial loss in

1932 into a modest profit for the industry as a whole in 1933. As a result, the industry begins the new year in an even stronger position financially than it was a year ago. The volume increases anticipated during the current year, if they materialize, should further strengthen the industry's position and add to the number of companies on a dividend basis.

While the industry as a whole was in the black in 1933, among the car makers, this was due almost entirely to Chrysler and General Motors. As a consequence, a big majority of the vehicle manufacturers ended up the year in the red, although efficient operation enabled them to return smaller deficits than in 1932. This spotty earnings situation was caused,

of course, by the tremendous popularity of cars in the lowest price brackets. To meet this condition there will be additional makers this year who will compete in the low-price market, but it is hoped that improving business conditions will result in a comeback of the medium and high priced models—D. B.

The Industry's Five-Year Record In Production and Employment

	Index Numbers 1923-1925 = 100				
	1929	1930	1931	1932	1933
Production	135	85	60	35	50
Wholesale value	140	80	53	30	36
Employment	114	82	66	54	53
Payrolls	122	77	55	40	40
Pay per worker	107	94	83	74	75
Real wages*	107	98	95	95	101
Employment per car	84	97	110	154	106
Payroll per car	90	91	92	114	80
Pay per dollar of sales	87	96	104	133	111
Average price	104	94	88	86	72

Note—1933 index numbers involve an estimate for December.

1933 vs. 1932 In Automotive Figures

Production—U. S. and Canada

	1933	1932	Per Cent Change
Cars and trucks	2,048,000	1,431,494	+ 43%
Cars	1,685,000	1,186,209	+ 42
Trucks	363,000	245,285	+ 44
Cars by wholesale price classes—Per cent of total			
Under \$500	82	65	
\$501-\$750	14	23	
\$751 and up	4	12	
Trucks by capacities—Per cent of total			
1½ tons and under...	92.7	92.3	
2-3 tons	6.1	5.4	
All other	1.2	2.3	
Wholesale value			
Cars and trucks	\$970,200,000	\$793,045,300	+ 22
Cars	\$795,200,000	\$650,781,297	+ 22
Trucks	\$175,000,000	\$142,264,003	+ 23
Average wholesale price			
Cars	\$471	\$549	- 14
Trucks	\$482	\$580	- 17

Retail Sales—United States

Cars and trucks	1,770,000	1,276,800	+ 39
Cars	1,510,000	1,096,400	+ 38
Trucks	260,000	180,400	+ 44
Cars by list price classes —Per cent of total			
Chevrolet, Ford and Plymouth	69.3	63.1	
Others under \$750	16.8	7.6	
\$751 to \$1,000	7.7	17.3	
All others	6.2	12.0	
Number of motor vehicles scrapped	2,200,000	2,550,000	
Value of U. S. retail car sales at list prices....	\$984,000,000	\$843,000,000	+ 17

Registrations

World	32,820,000	33,602,839	- 2.4
United States	23,753,800	24,341,800	- 2.2
Per cent of world's automobiles in U. S.	72	72	
U. S. Cars	20,678,600	21,139,100	- 2.0
U. S. Trucks	3,075,100	3,202,700	- 4.0

Taxes

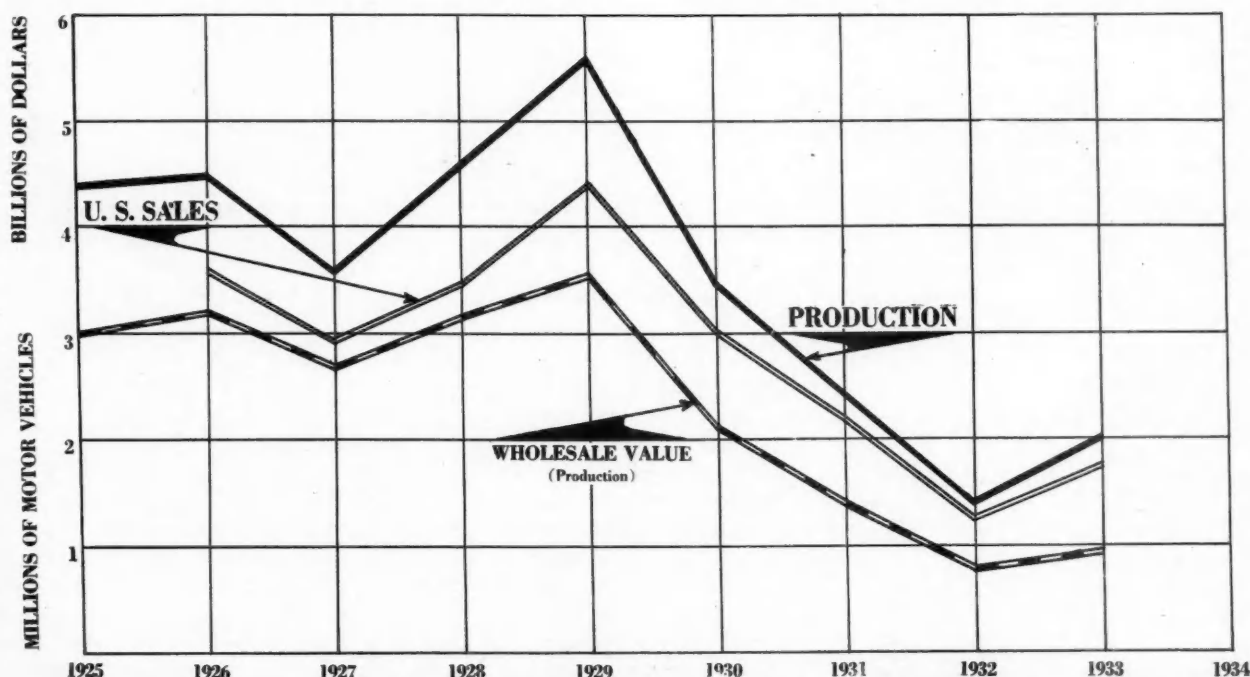
Total motor vehicle user taxes	\$1,170,000,000	\$1,076,021,597	+ 9
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Automotive Distribution

Total car and truck dealers	36,500	39,871	- 8.4
Garages, service stations and repair shops	98,161	97,361	+ 1.0
Supply stores	60,865	65,769	- 7.5
Total retail outlets, duplications eliminated ...	103,161	102,996	
Wholesalers	5,465	5,337	+ 2.0
Filling stations	317,000	317,000	

Exports

Number of American motor vehicles sold outside U. S.	233,000	181,000	+ 29
Per cent of production ..	11.5	12.6	
Value of exports from U. S. and Canada including tires and parts	\$135,000,000	\$96,066,842	+ 40



After three years of steady decline, production, U. S. sales and wholesale value of motor vehicle output all turned up. The trend to the low-priced car is reflected by the smaller increase in value than in production

JUST AMONG OURSELVES

1934 Better than We Dare Expect

CONSERVATIVELY optimistic are automotive executives as 1934 opens. "There are sound reasons for the conservative belief that 1934 will be a somewhat better year for all branches of the automotive industry than 1933," says W. S. Knudsen, executive vice-president of General Motors. Much the same sentiment is reflected in pre-show statements by Paul Hoffman, president Studebaker Sales Corp.; E. H. McCarty, president Nash Motors Corp.; Robert Graham, executive vice-president Graham-Paige Motors Corp., and others.

Nobody can be blamed for being coy about prophesying in view of the ill-repute which consistently bad guessing has brought to most prophets in the last few years. We would like to be on the safe side for once so that 12 months hence we might not be afraid to have our past statements unearthed—even if we couldn't point with particular pride to a definitely good guess. But somehow we can't do it. We've got a hunch that we can't keep to ourselves.

We think that 1934 is going to be a better year for the automotive industry than anybody dares think out loud right now. The industry has had its fingers crossed for so long that the digits have begun to grow together. Only consistently booming sales will pry them apart.

We don't look for a false flash in the first quarter with collapse thereafter. We look for progressively good business—relative to

the same months of 1933—throughout the year. We think the "New Deal" influences for good outweigh the detrimental effects of its many defects. We think 1934 will bring not only greater volume than did 1933, but profits in larger measure than the increased production. Occasional temporary "sinking spells" are to be expected.

So there we are on record. We think 1934 will reward courage, vigor and intelligence in full measure. Doubters may prosper, too, but not so fully nor so quickly as those who plan, produce and push.

* * *

Biggest Rewards for Opportunism?

SOMETIMES we wonder if the sales attitude of mind changes in the individual companies of any other industry as frequently or as quickly as in the automobile industry. The company of radical design one year, for example, is just as likely to be found among the group which changes least the next year.

The very human tendency to let well enough alone, of course, has much to do with this particular phenomena, but it does often make the outsider feel sometimes that a given radical move was based more on hope than on studied policies and beliefs. Few companies have made up their minds finally about the desirability of marked model changes each year. The tendency to hold to a basic body design in order not to dissatisfy owners by obsoleting their pur-

chases too quickly has been adhered to by almost every company for a while at one time or another—and departed from by almost every company at other periods.

True the success of the automotive industry may be due to this very refusal to fix on a long-term design policy; the biggest rewards may come with a maximum of opportunism.

* * *

Expediency Blinds Justice

WITH characteristic persistence and vigor, the automotive industry continues its battle for elimination of discriminatory taxation as the new Congress goes into session.

And with equally characteristic eyeing of places from which to extract maximum revenue with minimum difficulty, Congress will, we predict, continue the automotive excise taxes throughout 1934 at least. In this prediction, we hope we may be proved wrong—and will bend every effort to help bring about a result which would make it necessary for us to admit inaccuracy in prophecy.

The principle of discriminatory taxation is wrong, as so ably pointed out by the spokesmen of our industry on many occasions, and as reiterated in the brief filed recently by the N.A.C.C. with the Ways and Means Committee. In the case of the automotive industry, this brief points out, these special levies accentuate the depression-created sales resistance to its higher-priced products. While automobile ownership has decreased 10 per cent since 1929, special automobile taxes last year brought in 26 per cent more revenue than in 1929—reaching a new peak, in fact, of \$1,170,000,000.

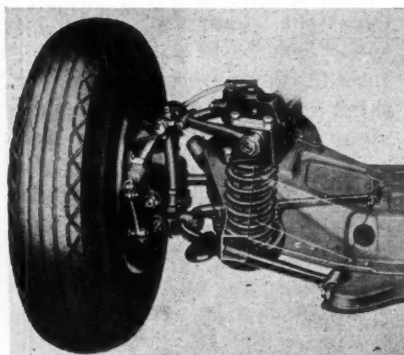
N. G. S.

New STRAIGHT 8 LaSalle Puts Cadillac in Medium Price Field

Radically new body lines and hydraulic brakes are among features—New Cadillacs and LaSalle have aluminum pistons, Hotchkiss drive and independent suspension of front wheels

HEADED by a new straight eight LaSalle, to sell in the medium-price field—with the lowest price ever put on a Cadillac product—the offerings of the Cadillac Motor Car Company for 1934 are easily the most striking in the entire General Motors line.

Independent wheel suspension with low-rate front springs of the coil type is, of course, a mechanical feature. Bodies also have been materially changed. In all there are six cars: The new LaSalle with a 119-in. wheelbase, three Cadillac Eights on 128-, 136- and 146-in. chassis, the V-12, also on a 146-in. wheelbase, and the entirely Custom-built V-16 with a wheelbase of 154 in. Engine ratings of the cars turned out by Cadillac are as follows:



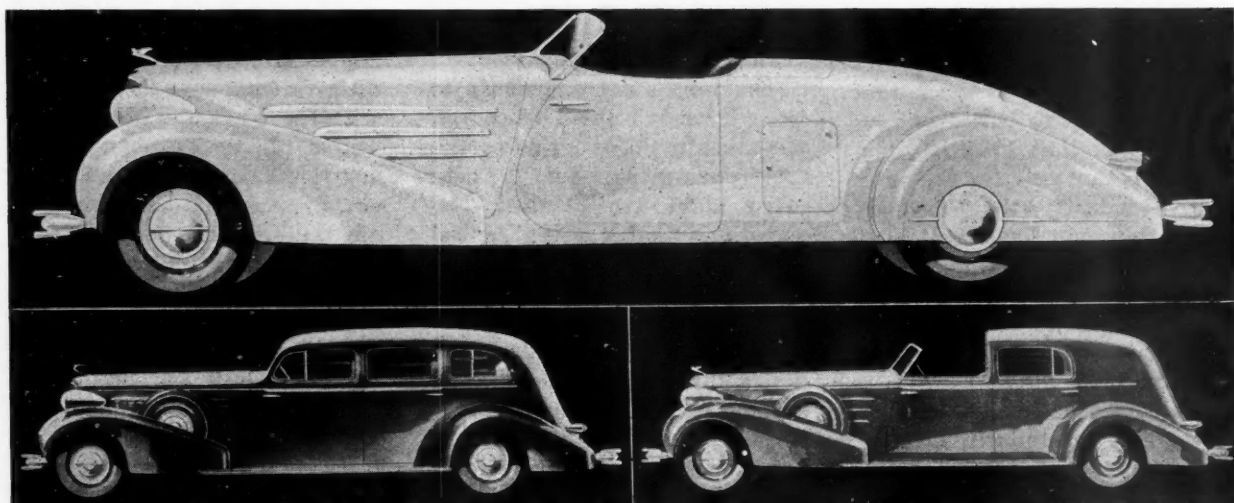
Close-up of the Cadillac's "knees"

	Horsepower
LaSalle	95 at 3700
Cadillac V-8	130 at 3200
Cadillac V-12	150 at 3600
Cadillac V-16	185 at 3800

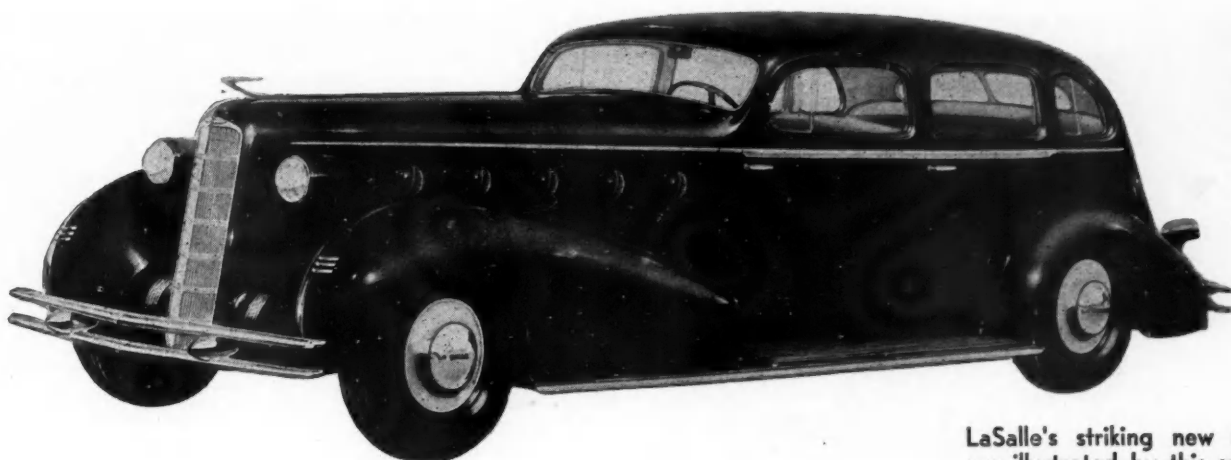
There is nothing staid or conventional about the new LaSalle bodies. At the front end there is a remarkably narrow and deep V-shaped grille, well ahead of the radiator core, and flanked by wide, horizontal curved ledges. These in turn blend into fenders, which are a close approach to the airfoil cowl-ing of airplane wheels, decorated with chevrons, chrome plated, and quite low in front.

Headlamps of streamline form have a concealed mounting directly on the radiator shell. Louvers are new, grilled die castings being fitted into circular openings in the hood. Chrome moldings are noted on running boards extending onto fender flanges, there being no true "skirts" on the LaSalle fenders.

Disk-type hub caps conceal the



Above—Roadster on the V-16. Lower left—Seven-passenger limousine on the V-12. Lower right—Five-passenger cabriolet on the V-16. All three bodies are by Fleetwood



LaSalle's striking new lines are illustrated by this sedan

wire wheels, the disks being lacquered to suit the body color specified. Windshields have a considerable slope and (on account of the Fisher no-draft ventilation) are locked in place. Coming to the rear, there is to be noted a long, sweeping back panel which conceals the spare-wheel-and-tire mounting. The rear window has a dividing molding in the center. Tail lights, of bullet shape, and built into the fenders, have hollow lenses, projecting in such a manner that they can be seen from the side, as a warning signal.

Rear fenders are fish-tailed, for streamlining effect, with the gas tank filler built into the right rear fender. Bumpers are unique, with their double-bar construction and built-in coil springs to provide a cushion in case of impact. Bumper brackets are tubular, with a telescoping mounting containing this spring.

Bodies are 2½ in. wider than last year but have the same overall length. As on other General Motors cars, cowl ventilators open toward the rear instead of to the front. Two Airtone horns are standard and are mounted under the hood. There is a new instrument panel, with provision for radio installation in the center.

While some of the mechanical units have parts interchangeable in design with similar ones on other General Motors cars, Cadillac officials state that these units, including the engine, are being built in the Cadillac plant, and to Cadillac standards.

The eight-in-line engine has a bore of 3 in. and a stroke of 4¼ in., making the displacement 240.3 cu.in., and its output rating is 95 hp. at 3700 r.p.m. Pistons are of Lo-Ex aluminum alloy. There are five main bearings ranging in diameter from 2⅜ to 2¾ in. The

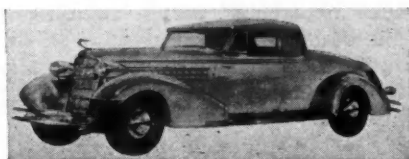
clutch is a single-plate dry type and the transmission has quiet helical gears for all speeds. Transmission to the semi-floating rear axle is through spiral bevel gears. The front-wheel suspension system is of the same basic type as used on Cadillac models.

It is to be noted that hydraulic brakes are standard on this car—a departure for the Cadillac company. Performance of the new LaSalle is said to be considerably ahead of last year. Tire equipment is 7.00/16 low pressure.

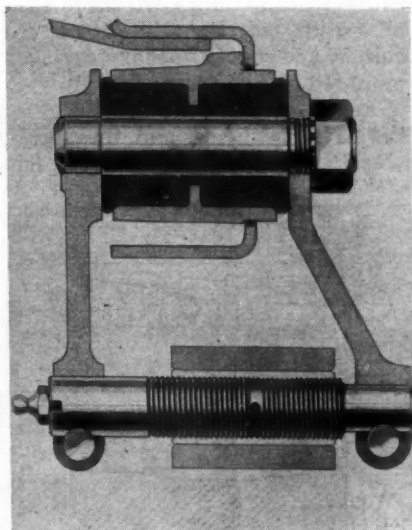
Cadillac Eights

The Cadillac Eights are somewhat more conventional in appearance than the new LaSalle, yet are distinctly new also. They have the same type of bumpers as the LaSalle, bullet-shape parking lights under the headlamps, completely new fenders and running boards, shutters instead of louvers in the hood (an appearance of two rows of shutters being conveyed by a central chromium-plated fin), sloping rear panels, and a new front end with deep grille.

On all of the new Cadillacs the radiators are located forward of the wheel axis, a change brought about by shifting the powerplant forward some 8 or 10 in. This in-



Convertible coupe on the V-8



Cadillac rear shackles have rubber bushings at the top and threaded bolts and bushings at the bottom

LaSalle Specifications

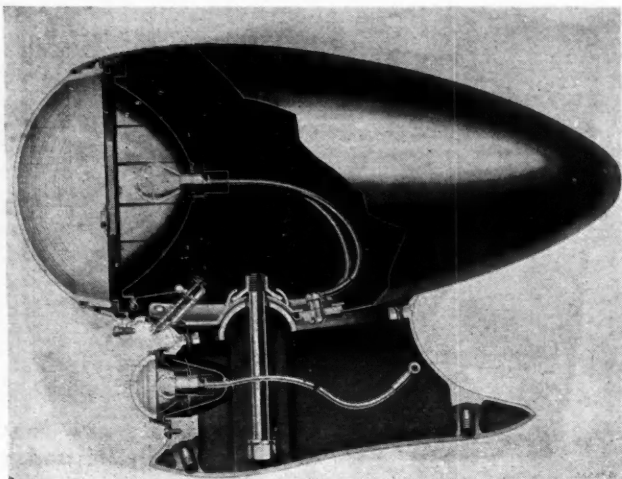
Wheelbase	119 in.
Engine	L-head straight eight
Bore and stroke	3 x 4¼
Piston displacement	240.3 cu. in.
Pistons	Lo-Ex aluminum alloy
No. main bearings	5
Clutch	Dry plate
Transmission	All helical gears
Rear axle	Half-floating
Drive	Hotchkiss
Front springing	Independent parallelogram type
Brakes	Hydraulic
Tires	7.00/16

Cadillac High Spots

Independent front suspension, link parallelogram type, coil springs have 8-in. compression range. Sidesway stabilizer at the rear.

Carburetor air intake through upper part of radiator, said to reduce intake temperature by 100 deg. and to permit increase in compression ratio from 5.4 to 6.25 with increased spark advance, resulting in better economy.

Hotchkiss drive in place of torque tube. Lo-Ex "alumilited" aluminum alloy pistons. Current control on generator.



Partial section through "bullet" fixed focus headlamp and parking lamp

creases the moment of inertia of the spring-supported mass around its transverse axis of oscillation, thereby reducing the pitching action. This change, together with individual steering connections, permits the use of very soft front springs and imparts a "flat ride" to these new creations.

The powerplants of all three Cadillac Eights are similar. An important innovation consists in carrying the carburetor air intake through the upper part of the radiator core, so that air is being drawn in from outside, rather than from under the hood. This arrangement is said to lower the inlet temperature by as much as 100 deg. F., thereby reducing the tendency of the engine to detonate and permitting the use of a compression ratio of 6.25 (against a former ratio of 5.4) and of increased spark advance, the two together resulting in a higher fuel economy.

Engine mounting is now of the five-point type, with the rear support well back of the transmission, on the housing of an extension of the transmission main shaft, supported on a ball bearing. The rea-

son for extending the shaft beyond the transmission proper is that this reduces the length of the propeller shaft and its tendency to whip. Lubrication of the ball bearing on the shaft extension is from the transmission, which is of the "all-quiet-gear" type. The conventional Hotchkiss drive has supplanted the torque-tube construction formerly used.

Another major innovation for Cadillac is the adoption of Lo-Ex (aluminum) alloy pistons in all engines. These are given an anodic treatment (called "alumilizing"), the "deplating" action forming a film of hard aluminum oxide on the surface, which is said to impart exceptional wearing qualities to the pistons.

Starter engagement is through a push button on the dash, energizing a solenoid on top of the starter motor. Needle-bearing universal joints of Mechanics make are used. Since the flexibility of the engine mounting has been increased, the clutch and brake pedals are now mounted on the frame.

Rear springs—which take both the driving thrust and the torque reaction—are long and quite flat,

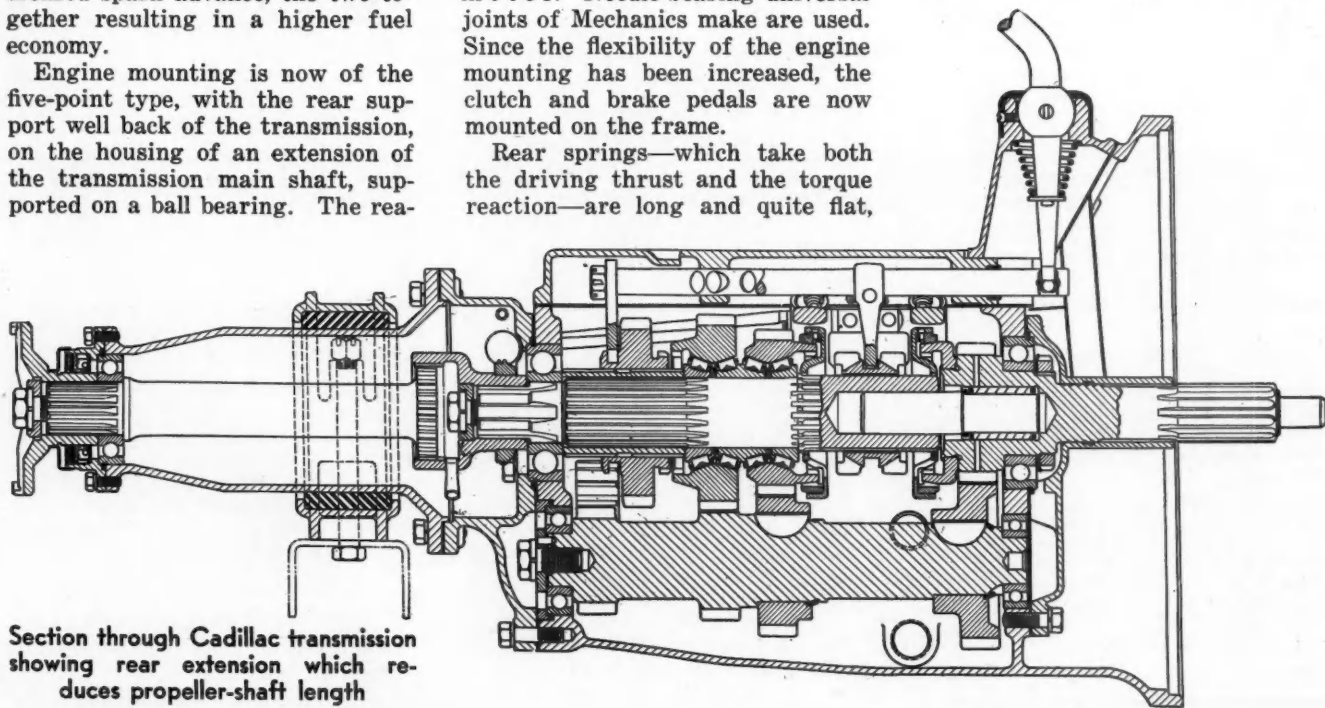
under normal load. Shackles at the rear have rubber bushings at the top and threaded bolts and bushings below. Front eyes are rubber bushed. Shock absorbers are manually controllable, and those at the rear are provided with inertia valves.

A torsional anti-sway stabilizer to offset the softer springs, has been installed at the rear, the torsion rod being mounted in rubber bushings in the frame.

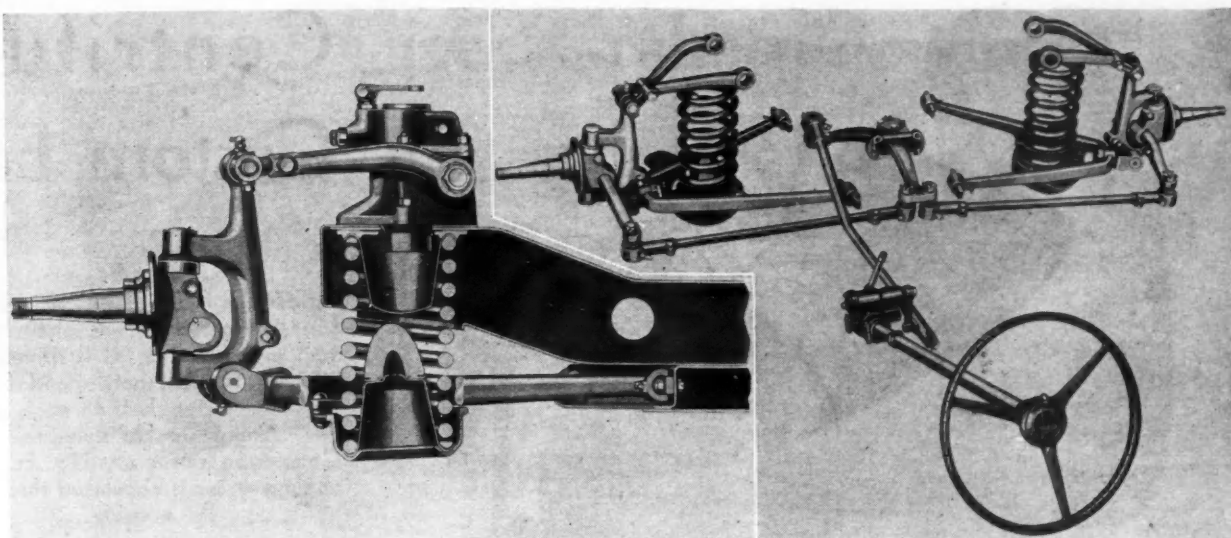
Wide use of welding is made in Cadillac frames for the first time this year. X-member legs are both welded and riveted to the side rails to form box sections. The front cross member is made of two stampings which are welded to each other and to the side rails. The rear cross member is welded in place. Webs of X-members are now so located that they intersect at the theoretical center, increasing the rigidity.

The independent wheel suspension system used on all cars is shown in an accompanying illustration. On the Cadillacs, shock absorbers are not bolted directly to the frame but are attached to the top of a malleable casting which is always under compression. Below this casting is located the coil spring. The shock absorbers form the frame hinge for the upper wishbone of the suspension, while the longer lower wishbone is hinged directly to the frame.

In spite of the soft front springs used there is less shock-absorber action at the front end than in previous Cadillac models. At the



Section through Cadillac transmission showing rear extension which reduces propeller-shaft length



Left, partial section through front wheel suspension and, right, the complete suspension and steering layout

rear, on the other hand, the damping action has been increased, particularly as regards rebound control. The range of compression of the front springs has been increased to 8 in.

Jack pads are provided on all springs. In the case of the rear springs this permits of the use of a deep fender flange, because, when the car is being jacked up, the rear wheel will drop slightly and clear the flange for a tire change.

Bodies are some 2 in. lower than formerly, partly owing to a reduction in frame height. Mufflers and certain other fittings on the frame have been raised to maintain the proper ground clearance. Separate steering links extend to the steering knuckles from an intermediate steering arm located at the "dead point" of the front-suspension mechanism. The steering gear itself is a "worm-and-double-roller" construction, equipped with anti-friction bearings. Ribbed cast-iron drums are now used on the Cadillac Eight, and rear brakes are cable-operated. Vacuum power units remain standard equipment.

V-12 and V-16

The V-12 and V-16 in general show the same chassis changes as the V-8s, but there are some points of difference. Owing to limited clearance between engine and frame, the steering gear in these models is located outside the frame side rail, while the drag link is inside. There are two cold-air intakes for these engines, instead of the single one on the Eights, and they are low down at the sides of the radiator core. In these engines also the compression ratio has

been increased to 6.25.

On the Fleetwood, the long-wheelbase Eight, and on these two cars the batteries are located under the front fender.

All cars of the Cadillac line have a new type of generator which is provided with current control rather than output control or voltage control. The "normal" charging rate of these generators is quite high and is constant for all speeds above 16 m.p.h. A relay automatically compensates for the extra drain on the battery in night driving, and the drop in the charging rate when all lights are turned on is only 2 amps. Generator cooling is assisted by an air scoop.

In their general lines the bodies on the Cadillac V-16 are much closer than those of the V-8s to the LaSalle bodies. The V-12 line bears a strong family resemblance to the V-8s.

Grilles on the V-16 are somewhat narrower than last year, but not as narrow as on the LaSalle. This car has horizontal fixed-opening louvers and one louver door near

the front end of the hood. Cowl lights on this model are streamlined into the fenders and have chevron-shaped lenses, to match the fender trim.

All Fleetwood bodies have three-section rear windows. The front doors are hinged at the center post. Five-passenger Fleetwoods have cabinets built into the backs of cross seats in place of the auxiliary seats provided in the seven-passenger models.

All Cadillac models have a new type of emergency control, in the form of an inverted crank lever mounted on the dash. Operation of emergency brakes is through cables.

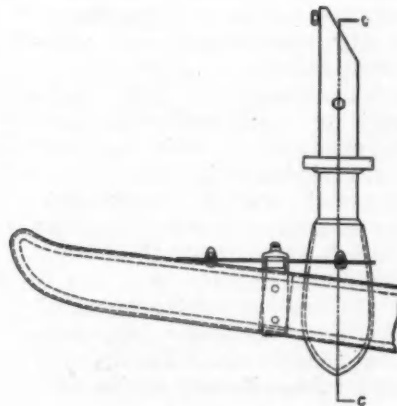
Independent Springing On Lancia's Show Model

NEW YORK—Italian Motors, Inc., distributors of Lancia and Isotta Fraschini, will exhibit one new Lancia chassis at the New York Show. It will feature an 8-cylinder, narrow-V engine cast en bloc, and will be equipped with the independent front wheel suspension.

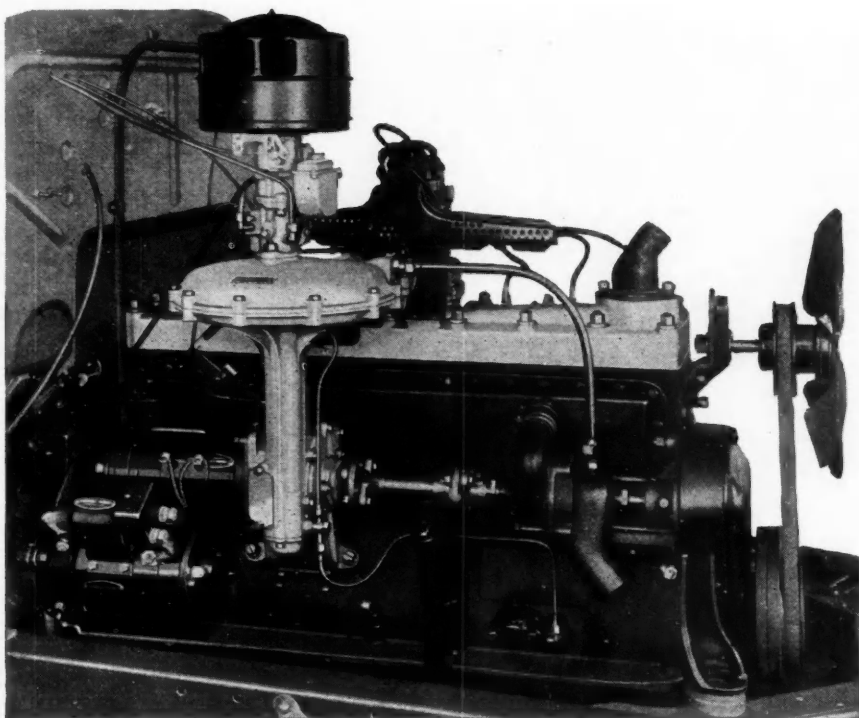
Top view of bumper
and section
through telescoping
mounting



SECTION C-C



January 6, 1934



Centrifugal Custom Eight

Installation of the centrifugal supercharger on the Graham custom eight engine. It is driven at 5.75 times crankshaft speed from the accessories shaft through rubber bushed double universals by Cone type worm gearing. Engine cooling water is circulated through the housing

SUPERCHARGERS—for a long time used on airplane engines but confined in the automobile field in this country to one or two custom-built cars—make their appearance for the first time on a quantity production automobile, the Graham Custom eight for 1934.

In the 1934 Graham line there are four cars—two sixes, a Standard and a Deluxe, and two eights, the Standard Eight and the Custom Eight. The six-cylinder chassis has a wheelbase 3 in. longer and carries bodies that are 2 in. longer than last year.

The bore of the Custom-Eight engine has been increased $\frac{1}{8}$ in. and the valves also are larger than those of last year's eight-cylinder engine. Larger valves are used principally to increase the breathing capacity of the engine and make the supercharger truly effective. Effects of supercharging on the torque and horsepower output may be seen from the accompanying curves, which relate to the engine with supercharger and without, respectively.

A centrifugal type of supercharger is used, with the rotor shaft mounted in plain bearings that are lubricated by the pressure system of the engine. The rotor is driven at approximately 5.75 times crankshaft speed, from the end of the generator shaft.

At the engine peaking speed of 4,000 r.p.m., the rotor therefore turns at 23,000 r.p.m. The drive is through rubber-bushed double uni-

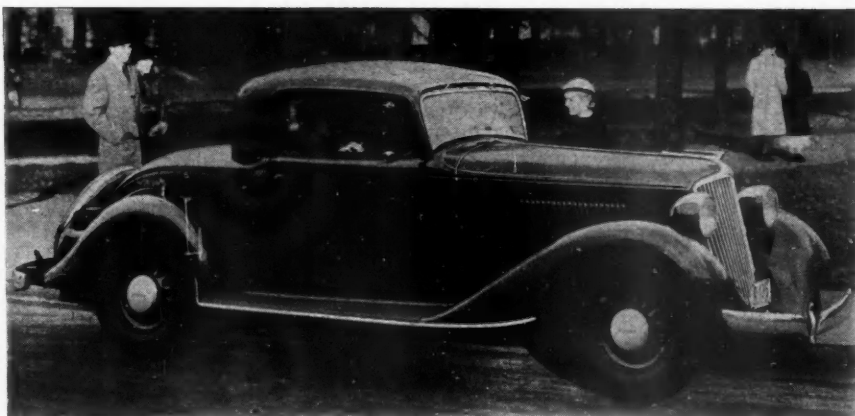
versal couplings to a Cone type worm-and-wheel combination (see *Automotive Industries* of Oct. 14, 1933). These gears are credited with the remarkably quiet operation of this unit.

In applying the supercharger, special care was taken to assure satisfactory operation and low fuel consumption throughout the speed range. Fuel economy is said to have been improved markedly at the higher operating speeds. Cold starting is greatly facilitated by both the better mixture distribution and the more energetic mixture agitation.

Engine cooling water is circulated through the housing of the supercharger, its function being to warm the mixture, particularly at low engine speeds. This, of course, implies that the supercharger is

located between the (downdraft) carburetor and the inlet manifold. A hot spot on the manifold is dispensed with. The carburetor is a Stromberg fixed-jet, plain-tube design, this type having been selected on account of the low restriction.

In connection with the supercharger there has been provided a "two-stage throttle," by causing the accelerator pedal to pick up a preloaded spring at that point of its travel which corresponds to normal engine output without supercharger. (This is evidently a safety measure, enabling the driver to tell by the "feel" of the accelerator when he is operating his engine above or below its normal output limit—Editor.) For the eight-cylinder engine there has been developed a new aluminum cylinder head with increased compression ratio (6.7). Valves are of $\frac{1}{8}$ in. larger clear diameter, for increased breathing capacity. The chain driving the camshaft and accessories shaft (generator, water pump, and



The Graham coupe for 1934

Supercharger Gives Graham 42 Per Cent More Power

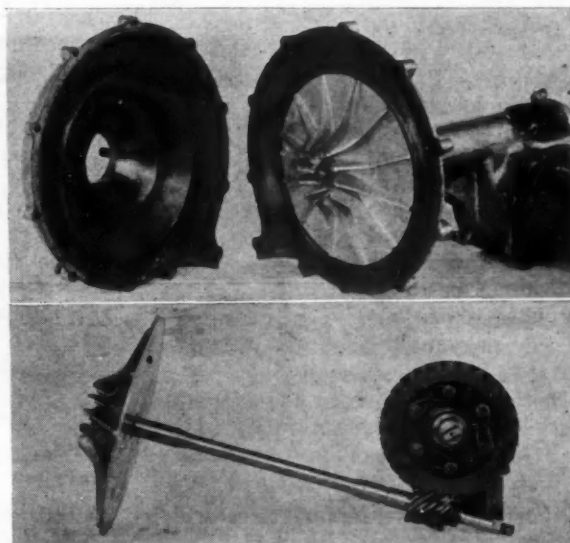
Economy and torque improved—Line for 1934 also includes standard eight and standard and custom six-cylinder models

supercharger) is considerably wider than formerly, so it will take care of the increased load due to the supercharger.

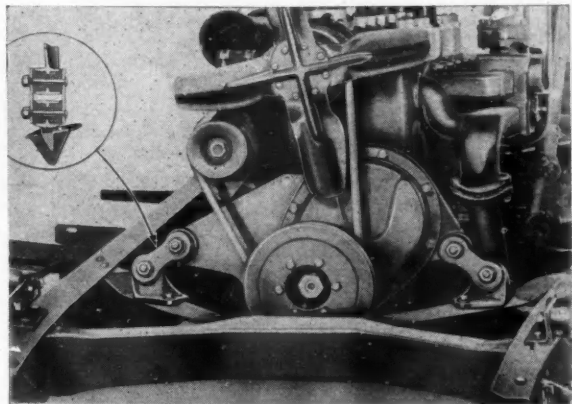
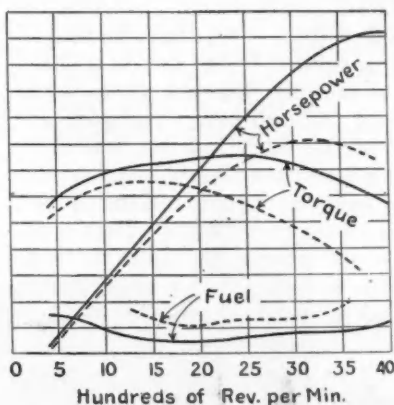
Reverting to the six for the moment, in addition to the larger bodies and longer hood, several important mechanical refinements have been made. Frames are provided with a small X-shaped member at the front end, instead of the former K-member, to further increase the rigidity. Near the center of this member the flanges are welded together.

A rather unique mounting was adopted for the front of the engine during the past selling season. There the engine is carried on two rubber-bushed shackles as used in connection with chassis springs. The center lines of these shackles intersect at a point corresponding roughly to the neutral axis of the engine, which axis extends from the rear support through the center of gravity. Unsymmetrical motion of the shackles under torque affords a means of automatic damping, the damping force increasing with the amplitude of torsional vibration. The mounting is not sensitive to slight defects of alignment, and the flexibly mounted engine has a vibration frequency apparently well be-

Right—Two views of the supercharger rotor, one showing the housing and the other the gearing



Below — Comparative horsepower, torque and fuel consumption curves for the custom eight with and without supercharger



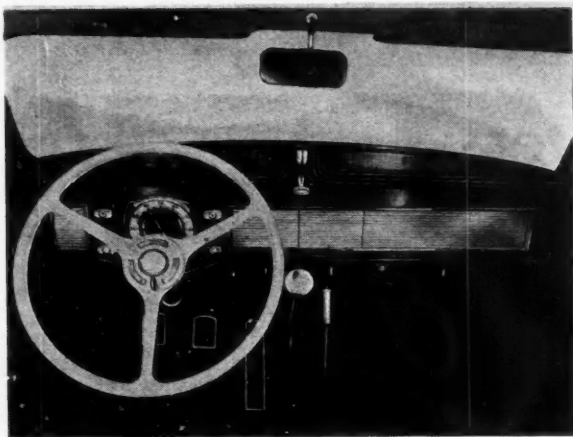
Rubber-bushed shackles now serve as front supports for the six-cylinder engine

low that of torque impulses even at idling speeds. Compression rings are the new Perfect Circle 70s.

On the six-cylinder engine the water pump is now combined with the fan, and accessories drive is by belt. Automatic heat control is provided for the intake manifold. Front springs are 2 in. longer than formerly and somewhat softer in action, this change being made permissible by the increase in wheelbase. The characteristic Graham banjo X-member frame design and outboard springs are retained.

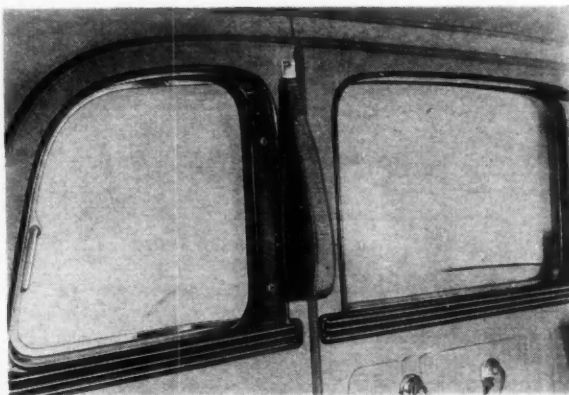
Transmissions remain unchanged, but free-wheeling has been made an optional feature on all models this year. Clutches have cushion springs in the hub. Universals are of the needle-bearing type. The rear-axle ratio is now 4.18 to 1, and the top speed of the car is higher than formerly.

Steering gears are now of the roller-bearing cam type. The brakes have thicker ($\frac{1}{4}$ in.) linings, $1\frac{3}{4}$ in. wide. Shoes are of hot-rolled T-section steel. Sixteen-in. wire wheels and steel-spoke wheels are



Left, Deluxe six and all eights have this type of dash with instruments in a single group in front of the driver. A satin chrome finish panel conceals compartments for smoking set, radio dials and parcels. Steering wheel, gearshift ball, handbrake handle, etc., are finished in ivory.

Right, The rear quarter window swings to provide ventilation. Front windows when in the closed position, may be moved back to provide a narrow slot through which air is drawn.



optional, and low-pressure tires are carried.

On the Deluxe Six there is a new instrument panel, with the instruments on the left, a large glove compartment at the right, and provision for radio installation. There is more sweep to all running boards, and the new models are distinguished by a refined front-end appearance combined with a longer hood and a single, large cowl ventilator.

There is $\frac{1}{8}$ in. difference in bore between the standard and Custom eights, the former retaining substantially the same engine used last year. Both cars have front springs that are 4 in. longer (now 40 in. long) and somewhat softer, 16-in. wheels carrying low-pressure balloon tires, completely new body interiors (also found on the sixes) and somewhat less weight. Sectional metal spring covers are standard equipment on the eight.

The larger valves and new cylinder heads are found in both engines. Vacuum control of the spark advance is provided in the Custom Eight, which, on account of being supercharged, requires more spark advance than an engine with atmospheric induction.

Detail design of the supercharger departs from what has been considered conventional practice in many points. The rotor, instead of being splined to the shaft, is fitted to a steeply tapered hub, being driven through keys. Keyways are cut in the rotor hub by first drilling holes at the proper locations for the ends, and then milling a slot connecting these holes. This automatically provides fillets at the ends of the keyways. The rotor is balanced to within $\frac{1}{25}$ oz.-in.

The capacity of the supercharger has been so chosen that low-speed requirements are properly taken care of. A liberal supercharging

capacity also makes it possible to keep the mixture temperature below about 160 deg. F. even under conditions of wide-open throttle operation.

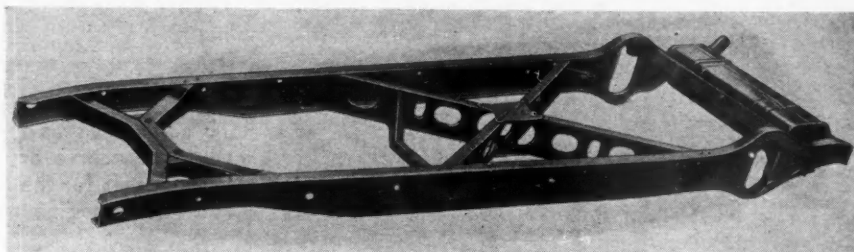
The Cone-type gearing, produced on special gear hobbers manufactured by the Michigan Tool Company, comprises a lead-bronze wheel and a worm of hardened steel. The developed tooth angle is in the neighborhood of 45 deg.

An ingenious lubrication system has been worked out. Oil drains from the gearcase directly into the crankcase, but there is a small sump in the supercharger gearcase, whose overflow is located on such a level that about two-thirds of the tooth is submerged in oil when the engine is at rest. This helps in cold-weather starting. Gear lubrication in regular operation is through drill holes in the worm shaft and worm, debouching at the bottom of the tooth spaces. The upper bearing is provided with a breather opening of fixed size, in a separate steel stamping, the object of which is to prevent oil from this bearing entering the rotor housing.

The only point where more than the usual degree of accuracy is required, in either manufacture or service operations, is in the fitting of the gears. Shaft bushings, etc., have normal crankshaft-journal clearances. The maximum horsepower with supercharger is 135 at 4,000 r.p.m., while the maximum torque of 210 lb.-ft. (formerly 175) is attained at 2,400 r.p.m.

The most notable effect of the supercharger is that acceleration is smooth throughout the whole range and reaches a maximum value at the current normal driving speed of 50 m.p.h. Under these conditions acceleration from 50 to 70 m.p.h. is quite outstanding.

The supercharged car therefore should be particularly advantageous for overtaking on two-lane roads with heavy traffic, on which it is ordinarily quite difficult to get ahead.



The frame of the six-cylinder model has an X-shaped member at the front.

Crank-Arm Front Suspension Features New Pontiac Eight

Longer wheelbase, new 6.2 GMR head, vacuum spark control with octane selector and KY frame are some of outstanding features

FOR 1934 the Pontiac Straight Eight comes with a longer wheelbase (117¼ in.) and weighs some 220 lb. more. It embodies such mechanical improvements as front-end independent springing of the crank-arm or Du-bonnet type, increased power resulting from refinements rather than increased engine displacement, a new frame designed specially with a view to increased torsional rigidity, vacuum spark control, octane selector, larger batteries, a generator of increased capacity, a co-incidental starter, a chassis stabilizer, and new headlighting.

The general appearance of the cars has not been materially changed, although there are several new features at the front end, such as concealed bumper mounting, a vertical-bar chrome grille with more slope than formerly, V-

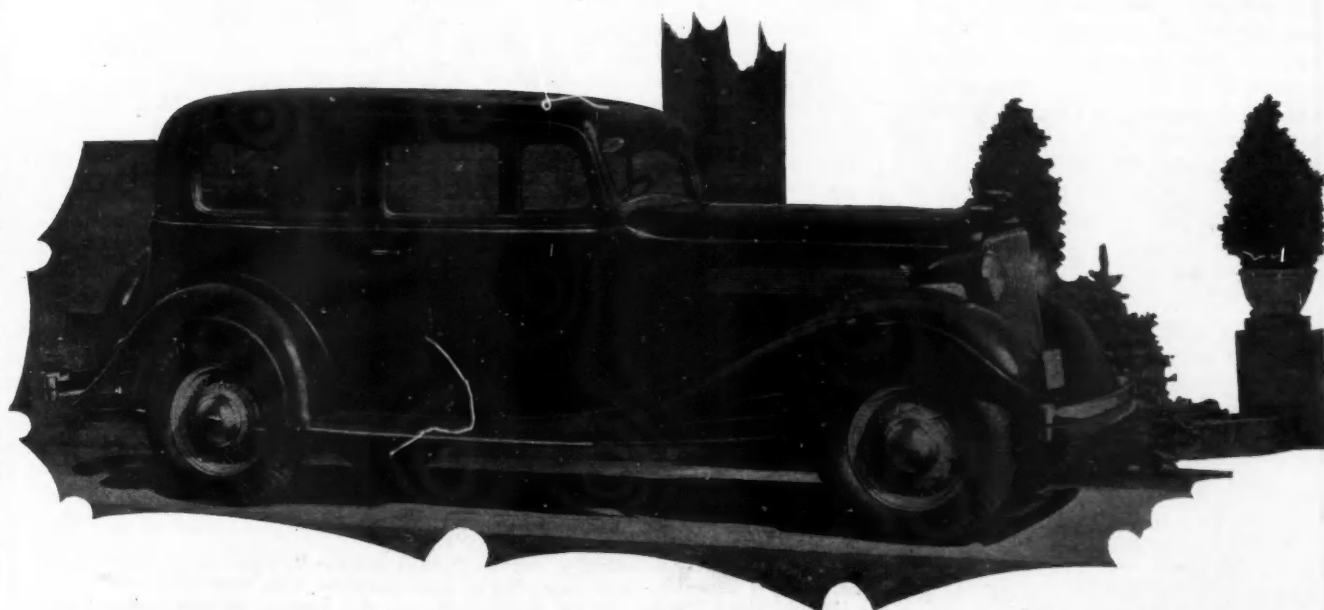
shaped, and deep enough to eliminate the need for a radiator splash apron; wider front fenders, a new design of hood louvers, larger fender indicator lamps, and overlap of the hood over the cowl. Chrome molding on running boards, new wire wheels with tires of larger section, and longer and lower fenders are other items affecting the appearance of the cars.

The front-end suspension, of course, is the most important mechanical change. This was described briefly in *Automotive Industries* of Dec. 23, and a drawing of the arrangement is reproduced herewith. It will be seen that double-acting shock absorbers of the hydraulic type are built into the spring housing and that there is a link between the brake backing plate and the spring housing. This link has needle bearings in its con-

nections, which type of bearing is used also on the suspension crank arm. With this type of suspension there is evidently no tendency for spring action to alter the camber and toe-in of the steering lay-out. There is a ball thrust bearing on each king pin to take the load of the car.

Other comfort items include increased body room and improved ventilation. Rear springs are 54 in. long and are controlled by single-acting shock absorbers.

Engine output has been increased by raising the compression ratio to 6.2. The use of so high a compression ratio in an engine designed to burn standard-price fuels is said to be rendered possible by the new G. M. R. cylinder head, in which there is a boss in the combustion chamber directly over each valve. This boss is said to improve both

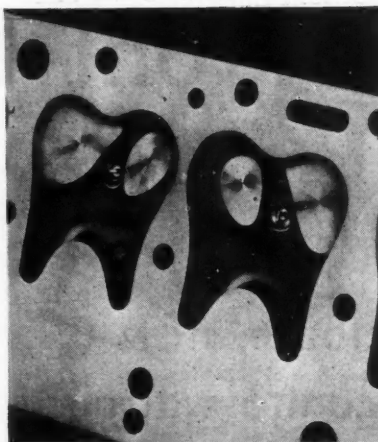


The 1934 Pontiac two-door sedan

the breathing action and combustion-chamber cooling. Satisfactory use of a high compression ratio is helped further by the provision of vacuum spark control. The regular spark governor in the distributor determines the minimum spark advance for any given speed, which corresponds to full throttle, and the vacuum spark control advances the spark further for part-throttle operation. Manual spark adjustment (octane tuning) is provided at the distributor head. The air cleaner and silencer and the fuel pump have been improved in detail. A. C. Model K-7 spark plugs, with a gap of 0.025 in., are fitted.

To compensate for the increase in the effective wheel diameter due to use of larger, 6.00-in. tires, the rear-axle ratio has been changed to 4.55 to 1, which makes the engine revolutions per mile of travel substantially the same as last year.

An automatic by-pass in the inlet of the crankcase ventilating system



Detail of Pontiac G.M.R. cylinder head. Note bosses over each valve

prevents the suction from becoming excessive at high car speeds, thereby preventing loss of oil.

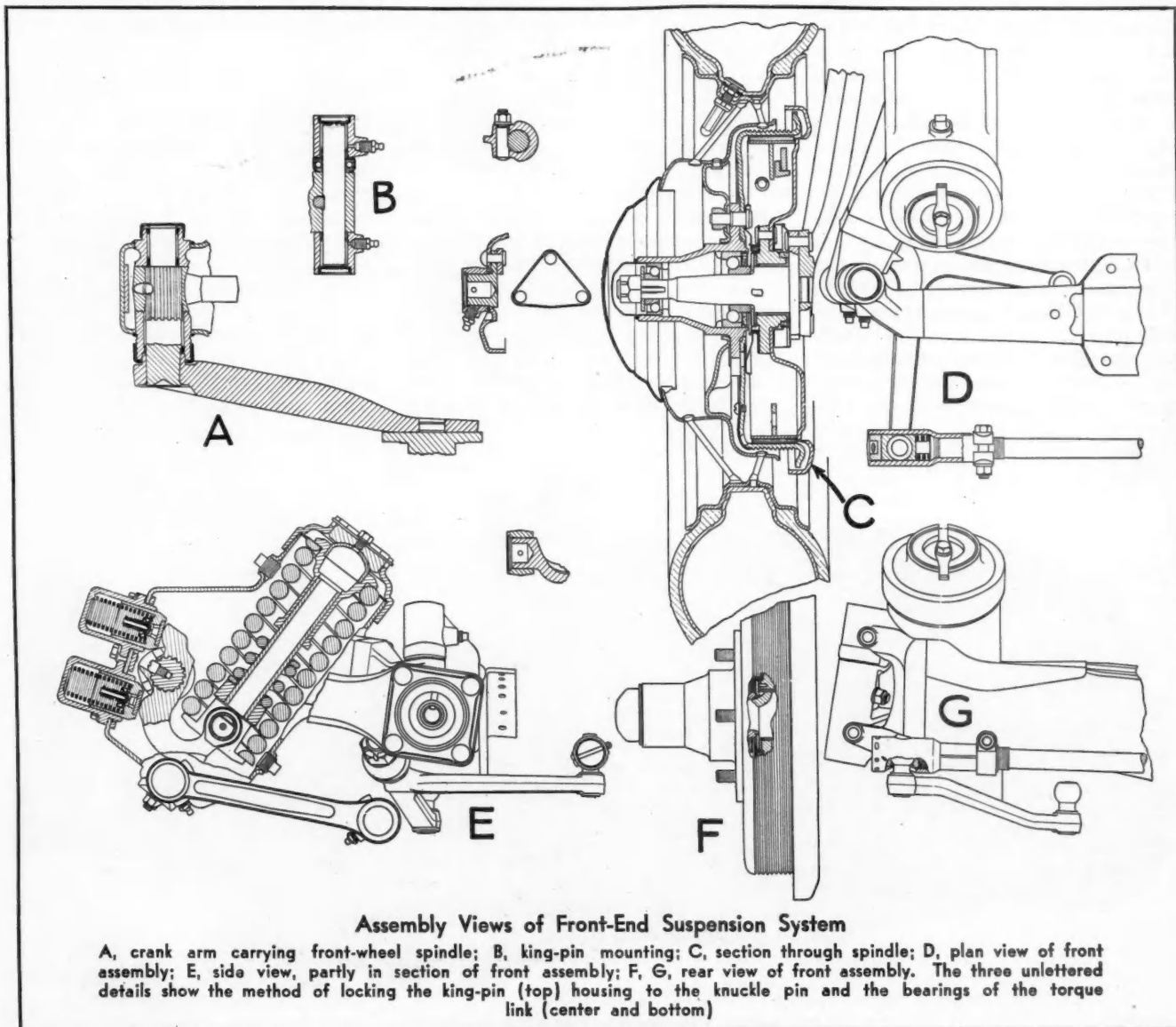
Starter engagement is by a solenoid on the starter which actuates a Bendix shift. This solenoid is en-

ergized by a switch connected to the starter pedal. As soon as the engine starts, a vacuum switch connected to the intake manifold interrupts the circuit.

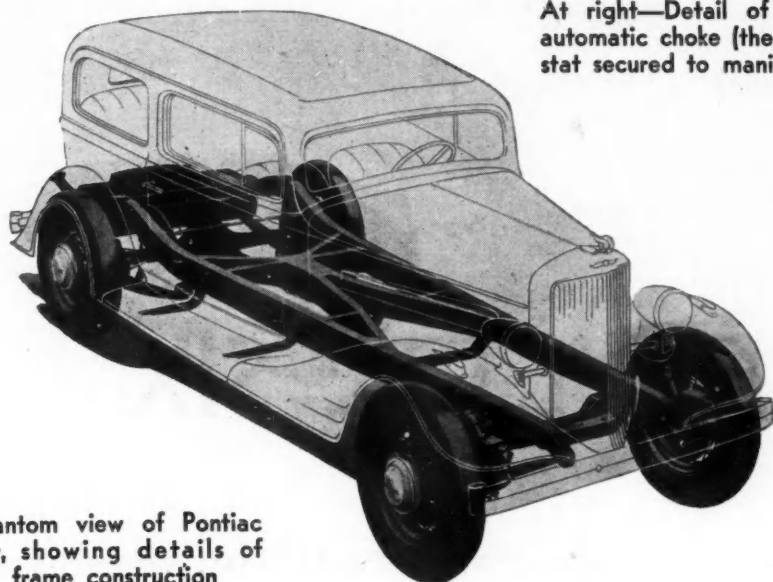
The outboard bearings in the rear axle have been moved 11/16 in. farther out, to reduce the axle moments. Torque-tube drive is continued.

Brake drums are now of high-carbon, high-manganese pressed steel, and the brake-operating cables are inclosed in conduits filled with grease. The brakes are of the Bendix two-shoe servo type.

A steering gear of the worm-and-roller type is now used, with the worm mounted on roller bearings and the roller on ball bearings. This gear has a ratio of 16 to 1. This increase in the steering ratio and the increased efficiency of the mechanism are provided to take care of the effect of the outward lean of the wheels on curves, the wheels tilting with the body. Tilt or sway



At right—Detail of the automatic choke (thermostat secured to manifold)



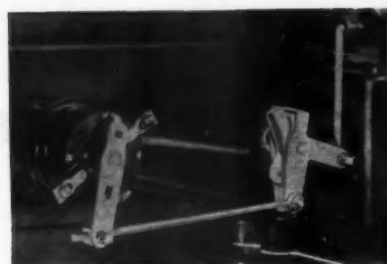
Phantom view of Pontiac car, showing details of frame construction

of the body, of course, is limited by the torsional stabilizer at the rear of the chassis.

The frame of the new Pontiac is much stiffer torsionally than that of last year's model. It is a modified X-member frame, designated as a KY frame. Front legs of the X are carried forward in the side rails to form a strong box section

ahead of the dash. From the center of the X, transverse braces run to the side rails. There are additional braces at the forward legs of the X-member. Front cross members are extremely rigid.

The rear end of the muffler tail pipe is now chromium plated to prevent its corrosion. The gasoline tank is vented so that any overflow



will drop to the ground. Wire wheels have 48 spokes and wider rims, and rib-tread tires are fitted to reduce noise. Chassis lubrication is by means of Zerk-type high-pressure fittings. There are two positions on the light switch, one for city and the other for country driving. When set for country driving, both beams, from 32 c.p. filaments, are up, and when passing another car, to prevent glare, the left beam can be lowered by pressing on the foot dimmer. This same asymmetric beam is used regularly in city driving, while for passing in the city, both beams are lowered and are supplied by 21 c.p. filaments. Fender indicator lights are so wired that they are lit up automatically when the foot dimmer is depressed for passing.

New Duesenberg Phaeton Has Disappearing Top

A NEW model announced by Duesenberg, Inc., at show time is a 5-pass. convertible phaeton, known as the Riviera phaeton, of which an illustration is shown herewith. It carries a 320 hp. supercharged engine. The top disappears completely into the rear deck of the body. When closed, it forms a graceful curve harmonizing with the lines of the body.

Duesenberg for a number of years has built convertible coupes in which the top when down was completely enclosed under the rear deck, but the Riviera is the first phaeton ever built by the firm in which the top disappears.

Hood, fenders, body and chassis of the new phaeton are finished in King George maroon, with the molding in a lighter shade. The striping is in silver, to harmonize with the chromium-plated wheel disks, exposed chromium-plated door hinges, and exposed exhaust manifold.

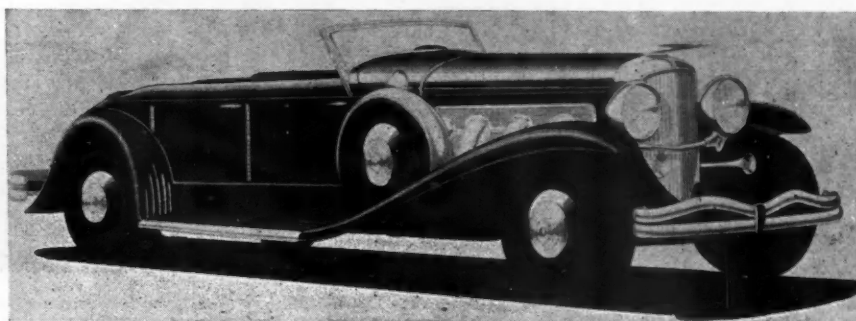
The windshield, which is straight horizontally but sloped vertically, is chromium-plated. It is hinged at the top to open outward, and is operated by a Mono-control mech-

anism. There are four large cowl ventilators, two on top and two on the sides of the cowl.

Doors are hinged on chromium-plated bronze hinges running the full length of both the front and rear hinge pillars. Glass in all doors, when down, is concealed by chromium-plated hinge flappers. Upholstery is in tan kid-glove leather, and is matched by deep brown heavy-pile carpets, both blending with the pleated door panels. The tan Haartz cloth top rounds out the color scheme. Seat cushions and backs also are pleated. The rear-seat back is adjustable

for pitch. The chrome-plated hardware is of Puritan pattern.

Chromium-plated engine-turned instrument panels in both front and rear compartments are equipped with white-faced instruments. There is an unusual collection of these instruments, including an eight-day, split-second clock, a 150-m.p.h. speedometer, a 5,000-r.p.m. tachometer, an altimeter, a brake-pressure gage, an oil-pressure gage, an ammeter, a gasoline gage, and a temperature indicator. The body is close coupled and mounted on the regular Duesenberg chassis having a wheelbase of 142½ in.



The top on this Duesenberg phaeton disappears into the rear deck

Nash Mystery Car Is

The LAFAYETTE SIX

A low-price 113-in. wheelbase
model with an L-head, 75
Horsepower Engine

IN bringing out its new low-priced car, Nash Motors Company has revived the name of LaFayette in the automobile field, a name once applied to a high-priced car developed and manufactured under Nash auspices. The new LaFayette is a six-cylinder car with 217 $\frac{3}{4}$ -cu. in. L-head engine and 113-in. wheelbase that is to be marketed in two lines, the Standard and the Deluxe. Each of these lines comprises five different body types. The articulated axle type of independent front wheel suspension is offered at extra cost.

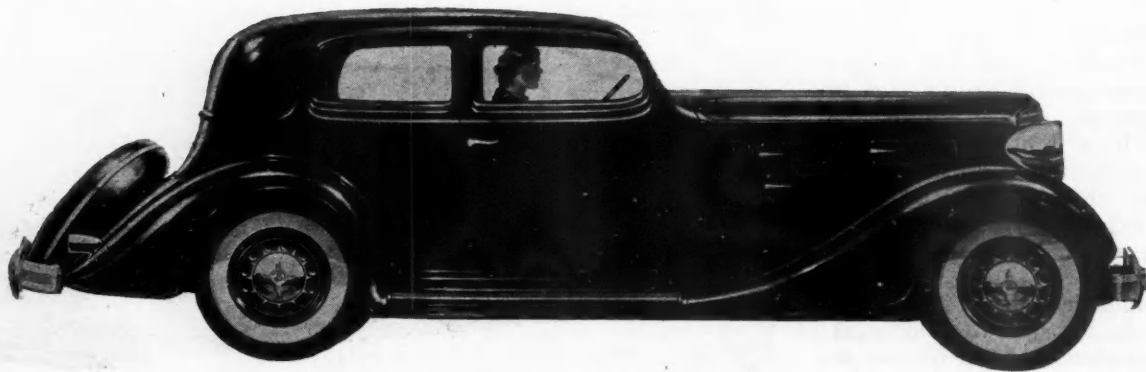
Among the features of the new car to which special attention is being called by the manufacturer are the following: Full-pressure lubrication to all bearings, including those of the piston pins (through

rifle-drilled connecting rods); aluminum-alloy pistons with invar struts; water-circulation control limiting the temperature difference between the front and rear of the block to less than 5 deg.; synchro safety shift transmission with machine-lapped helical gears; double-drop frame with long X-type sub-frame; worm-and-roller type steering gear; seven-bearing crankshaft with integral counterweights and torsional vibration damper, and metal-covered springs. Axleflex front axles, embodying a system of independent suspension, are offered as an option at extra cost.

The engine is of the L-head type, with a bore of 3 $\frac{1}{4}$ and a stroke of 4 $\frac{3}{8}$ in. It is said to develop 75 hp. at 3200 r.p.m. Engine mounting is of the four-point type, on rubber,

with an additional rubber-insulated stabilizer under the transmission. Intake valves are of chrome-nickel steel and exhaust valves of chrome-nickel-silicon steel.

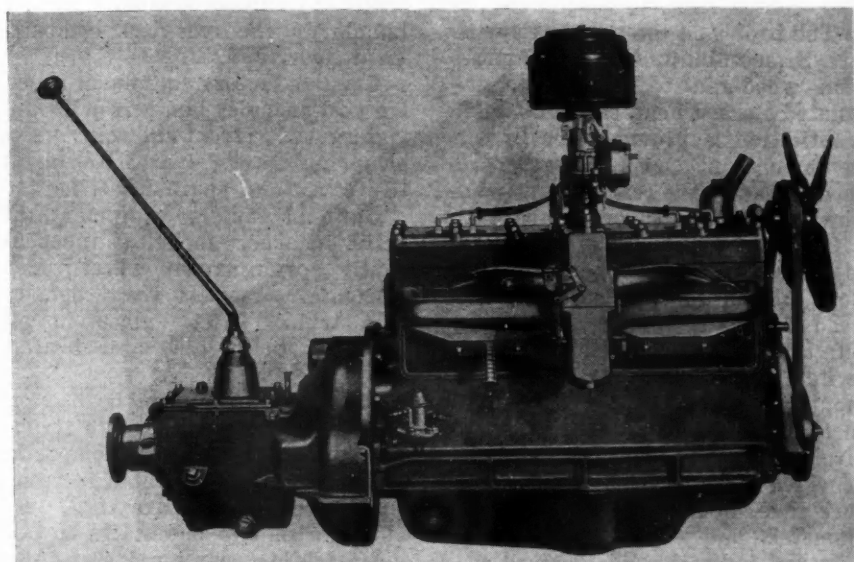
The crankshaft is forged with integral counterweights and has a torsional vibration damper. Its crankpins are hollow. The forged steel connecting rods are rifle-drilled for pressure lubrication of the piston pins. The bronze bushing in the upper end of connecting-rods is diamond-bored, while the bushings in the lower end are of the steel-back, babbitt-lined type, which type is used also for the main bearings. The camshaft is a one-piece drop forging with six steel-back, babbitt-lined bearings. It is driven by a silent timing chain. Features of the pressure



A two-door LaFayette model illustrating the long, sweeping lines

LaFayette Specifications

Engine	L-head six	Fuel tank capacity	16
Bore	3¼	Carburetor	Marvel downdraft 1¼ in.
Stroke	4¾	Heat control	Automatic
Piston displacement	217.76	Air cleaner and silencer.....	AC
Taxable horsepower	25.35	Cooling circulation	Pump
Maximum output	75 at 3,200	Radiator	Modine fin and tube
Compression ratio	5.3	Starting, lighting, ignition....	Auto-Lite
Pistons	Nelson-Bohnalite	Spark plugs	AC
No. of oil rings.....	2	Battery	Globe
No. of compression rings....	2	Clutch	Borg & Beck plate
Piston pin diameter.....	¾	Transmission	Direct, 1.63, 2.72 and reverse 3.35
Piston pin locked.....	Floating	Synchronous mesh	2nd and 3rd, helical
Connecting rod length.....	8¾	Freewheel	Optional
Crankpin journal	2 x 1 7/16	Universals	Metal
Lower rod bearing.....	Steel back, babbit lined	Drive and torque through....	Springs
Vibration damper	Rubber friction	Rear axle	Semi-floating
Crankshaft counterweights ..	4	Rear axle ratio.....	4.7
Main bearings	7, steel back, babbit lined	Tires	5.50/17 with 6.25/16 optional
Main bearing diameter.....	2 31/64	Wheels	Budd, steel artillery
Main bearing lengths.....	1¼, 15/16, 15/16, 1¾, 15/16, 15/16, 1¾	Front springs	36¼ x 1¾
Timing drive	Chain, Diamond	Rear springs	54 x 1¾
Intake valve material.....	Chrome nickel steel	Shackles	Threaded, except rubber at front end of rear spring
Intake valve diameter.....	1 21/32	Steering	Gemmer worm and roller
Exhaust valve material.....	Chrome-nickel-silicon steel	Brakes	Bendix
Exhaust valve diameter.....	1 17/32	Drum material and size.....	Pressed steel, 11 x 1¾
Valve seat angle.....	45°	Frame	X-dual double drop
Valve lift	5/16	Front tread	56¼
Engine lubrication	Pressure to mains, rods, pins.	Rear tread	59 11/16
Fuel pump	AC	Wheelbase	113



The LaFayette power plant which has a factory rating of 75 hp. at 3200 r.p.m. The piston displacement is 217.76 cu. in.

gal. tank, a camshaft-driven fuel pump, a fuel strainer and a single downdraft carburetor. The latter is equipped with automatic heat control, an air cleaner, an intake silencer and an automatic accelerating pump. An electric fuel gage and a manual choke control are located on the dash. The muffler is rubber-mounted and is claimed to incorporate a feature assuring a silent exhaust.

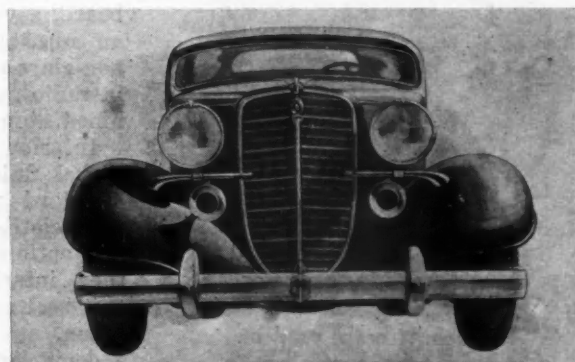
A third-brush-regulated generator charges the Globe 6-volt battery. The Bendix starter, of the automatic-engagement type, is actuated by a button on the dash. There is a coincidental ignition-steering gear lock on the steering-post bracket. The headlamp dimmer is conveniently located on the toe board. The car is wired for radio. Headlamps are of the twin-beam, double-filament type, and combined stop and tail lights with

lubrication system for the engine are oil filters, an oil-pressure indicator on the dash, and a crankcase ventilating system.

Cooling water is circulated by means of a large centrifugal pump, under thermostatic control. The temperature of the cooling water as it leaves the engine is shown by a large thermometer on the dash. A four-bladed, belt-driven fan draws air through the radiator.

The fuel system comprises a 16-

The LaFayette radiator is patterned after the regular Nash design. The lamp and horn mounting, however, differs in detail



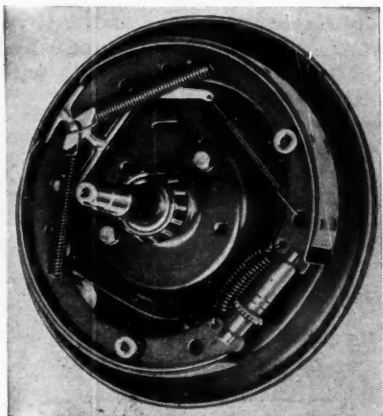
red reflector lenses are also standard equipment. The electric horn is mounted under the hood.

The clutch is a single-plate dry type, and the transmission has a bronze-clutch arrangement for synchronization before shifting gears. There are the usual three forward speeds and one reverse. Hotchkiss drive is used, and final drive to the semi-floating rear axle is by silent spiral bevel gears. The front axle is of the I-beam type, with reversed Elliott steering heads. Both axles carry Timken tapered roller bearings throughout. Independent front wheel springing of the Baker articulated axle type, described in Dec. 23 *AUTOMOTIVE INDUSTRIES*, is optional at extra cost.

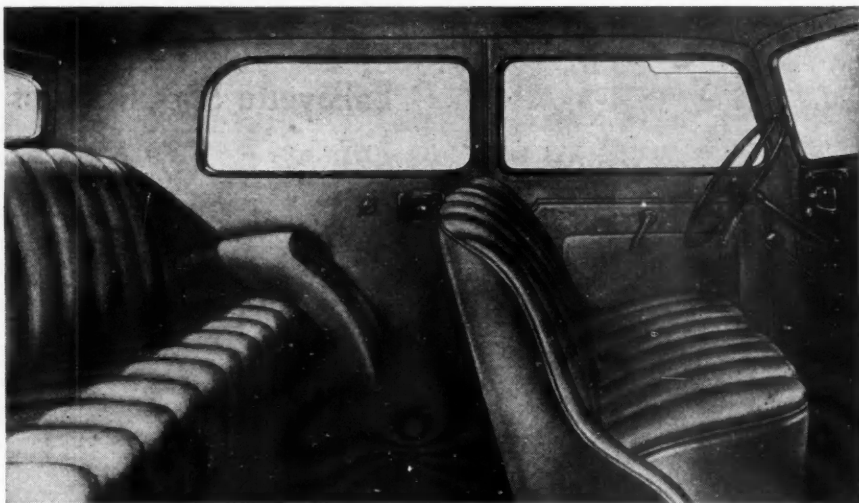
Unusual stability is said to be assured by what is described as the rigid X-dual low, double-drop frame with a long X-type subframe extending from the front cross member to the rear kick-up. There is one straight cross member at the front and there are two at the rear.

Semi-elliptic springs of alloy steel are used all around, the front springs being shackled at the front. Spring shackles are of the self-adjusting threaded type, while rubber bushings are used at the forward ends of the rear springs. A shock eliminator or kick-shackle is located at the rear end of the front spring on the steering side. Metal spring covers and push-gun-type lubricating fittings are standard. Spring action is controlled by Gabriel double-acting hydraulic shock absorbers with automatic and thermostatic control.

The four-wheel internal mechanical brakes are applied to pressed steel drums through the intermediary of cables enclosed in conduits. The parking brake lever, located at the left of the driver, applies the



The Bendix brake used on the LaFayette



Interior of LaFayette four-door sedan

brakes on all four wheels. The steering gear is of the worm-and-roller type, mounted on roller bearings. Wheel-and-tire equipment includes 5.50/17-in. full balloon tires on demountable steel wheels with drop-center rims.

The bodies on the new LaFayette are Seaman-built, of the composition wood-and-steel type and insulated against heat, cold and noise. Ventilation is provided for by air vents in front-door windows of all models and in the rear-quarter windows of the four-door sedans.

The three-spoke steering wheel is encased in hard rubber, with the horn button in the center at the head of the steering post. The carburetor-choke button and the light switch are located on the instrument board. An indirectly illuminated instrument panel carries an airplane-type speedometer, the face of which is translucent; an oil pressure gage, an electric gasoline gage, ammeter, and engine water temperature indicator, all grouped together.

Items of standard equipment include a safety-glass windshield, a package compartment, a disappearing ash receiver on the instrument board, a vacuum windshield wiper, an adjustable inside sun shade, a non-glare rear-view mirror, a built-in radio aerial, a tool kit and combined stop and tail lights.

Interior hardware has a bright nickel finish. Upholstery in the standard models is normally in broadcloth, but mohair and leather are optional at extra cost. Further interior equipment includes rear-seat arm rests in the four-door sedan, ash receivers, assist cords, a dome light, foot rail, robe cord,

large shirred pockets on back of the front seat, and curtains on back and rear-quarter windows.

The four-passenger coupe has a leather-upholstered rumble seat and adjustable rear window, together with a chrome-finished locking handle on the rear-deck compartment door.

Regular factory equipment at extra cost includes bumpers with upright guards (front and rear), metal spring covers, spare tire, metal tire cover and spare wheel lock.

Optional factory equipment, at extra charge, includes independently sprung front wheels, free wheeling, air-wheel tires, detachable trunk, safety glass in all windows, radio, hot-water heater, etc.

Royal equipment can be had on all models except those with standard built-in trunks, and comprises two spare wheels mounted in front fender wells, two spare tires, two wheel locks, two metal tire covers and a folding rear trunk rack.

Regal equipment, available on all models with standard built-in trunks, is the same as the Royal equipment, except that no folding trunk rack is included.

Crown equipment, available on all models, includes a deluxe instrument panel with electric clock, cigar lighter, extra sunshade, extra windshield wiper, and two chromium-plated horns mounted under chromium-plated headlamps. Twin stop-tail lights, also chromium plated, are built into the rear fender.

Body types offered in both standard and deluxe series are four-door sedan, coupe, rumble seat coupe, two-door sedan and two-door touring sedan.



PRODUCTION LINES

Helping Hand

More than ten million dollars has been paid to employees and their families by General Electric in death and disability benefits under group life insurance plans, according to an announcement by Gerard Swope. Within a year's time the amount of these payments increased by a million dollars, 4360 families and more than 600 permanently disabled employees have been the recipients.

99.99 Pure

On reliable authority we hear that European die casters soon will have the benefit of 99.99 per cent pure zinc so essential to automotive work. It was only with the introduction of zinc of high purity in this country that die casting applications became widespread. And really met the test of atmospheric conditions and the demand for high strength.

Fine Record

Fafnir Bearing is issuing in booklet form a little treatise called "An Outline of History for Anti-Friction Bearings." It's a digest of progress in the art and well worth a reading.

Big Advance

Understand that the Gray planer is now available with milling head attachments which increase flexibility and extend its range of usefulness in automotive die shops. Big machinery is showing the same healthy technological advances that have characterized the strides made by the machine tool industry in highly productive equipment.

New Note

Heald strikes a new note in industrial art in presenting its improved No. 81 internal grinder. The booklet describing this machine is a fine example of the effectiveness of type and illustration. You'll want to look it over whether or not you are immediately interested in the machine. Illustrations are particularly striking. All are from unretouched photographs taken with great cunning to show detail by a fine treatment of light and shadow.

What Say?

What are the prospects of using building convertible bodies in quantity production? A man who is quite an authority on such things claims that it's hard to build a job in quantity that will be free of rattles. His other objection is that the convertible will weigh more, thus bucking the present trend. This doesn't mean that it can't be done. People are working on new ideas and something worth while may come of it. Your comments will be welcomed.

Heats Uniformly

A controlled atmosphere, continuous clean process furnace was recently installed in the plant of the Moraine Products Company of Dayton, Ohio. This furnace used for clean treatment of oilless bearings, was designed and built by Surface Combustion Corporation. It is a muffle type furnace with a belt conveyor, and is unique in the fact that it provides uniform temperature necessary to complete the operation according to rigid specifications demanded. The temperature is uniform throughout.

Count 'Em

According to an estimate made at an S. A. E. meeting recently, transmission development now is enriched (?) by a total of 1878 patents. It may take a good staff of patent attorneys at the helm to steer a free course between the multitude of claims.

New Question

Now that Ford has publicly announced the use of an electric alloy cast crankshaft, the recent flood of speculation is thoroughly confirmed. But the definers may have a hard time coining scientific names descriptive of the alloys to be employed in this connection in the future. For instance, the alloys to date have been loosely termed electric furnace alloy irons. Now it seems that the Ford crankshaft is more properly an electric furnace alloy steel since it has a low carbon content, something like 1.20 per cent.

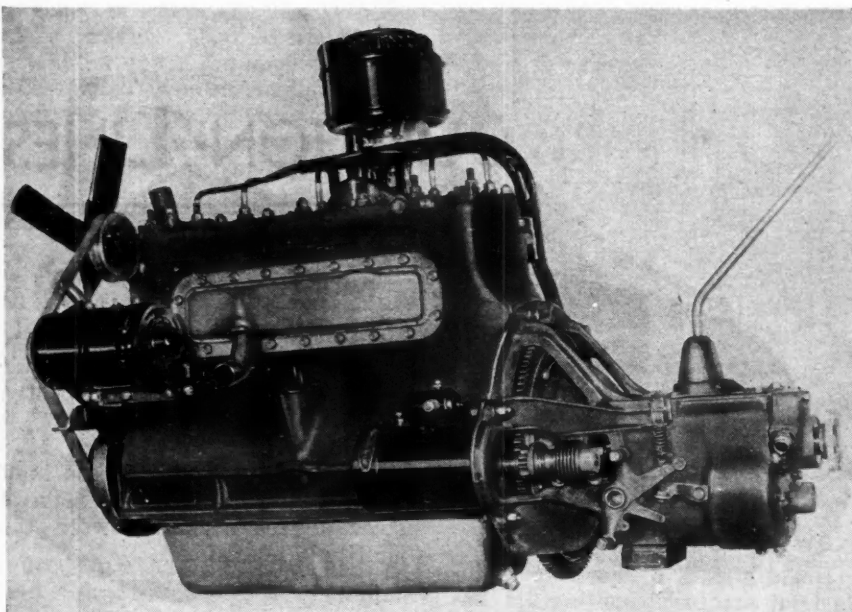
Near Sunlight

Two physicists of the University of Cincinnati recently showed a new type of mercury vapor lamp which is said to approximate sunlight. These men discovered that by adding a tiny particle of rubidium, (a rare metal), to mercury, red rays were added to the mercury spectrum, sufficient to closely approach daylight conditions.

Old Turnings

According to Prof. Roe who knows his machine tools, the milling machine is decidedly an American development while the planer is of British origin. Incidentally, the miller came into being about 30 years after the planer. Are you interested?—J. G.

MANUFACTURING
MANAGEMENT
METALLURGY



Left side of Terraplane engine showing air-cooled generator and solenoid controlled starter

DURING 1933 the Hudson and Terraplane established a reputation for outstanding performance. These same performance characteristics are continued in the 1934 lines, whose principal new features are modern bodies, new from radiator grille to rear fender, and a design intended to establish a similar reputation for ruggedness and reliability.

Not that mechanical innovations are absent. For those who want independent springing, Hudson is offering, as an option, on its 1934 cars, the Terraplane six, and the Hudson eight, a suspension system of the articulated-axle type. It has a definite advantage in that its installation requires no major changes in chassis design, whether in the steering hook-up or the springing. Basically it consists of a conventional I-beam axle in which the center section, between the spring-pads, is replaced by two links, one above the other, with cageless roller bearings in the joints. The design therefore assures vertical flexibility of the axle, permitting vertical displacement of either one or both wheels, through the parallelogram action of the links.

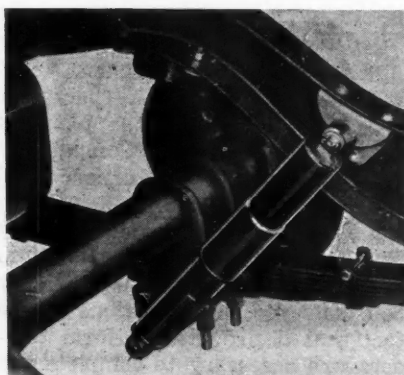
Both Terraplane and Hudson models are produced in standard and deluxe series, the latter being on longer wheelbases.

Further mechanical innovations for Hudson include a new carburetor incorporating an automatic choke, regulated both thermostatically and by vacuum; a two-speed

idle, also thermostatically controlled; automatic heat control, and an accelerating pump with seasonal adjustment.

Direct-acting shock absorbers operating at low pressures and having large oil capacities are credited with marked improvement in riding qualities. High-chrome iron is used for the new cylinder blocks of all models. The adoption of this material has made necessary the retooling of the cylinder block line with tungsten-carbide tools operating at much reduced speed.

A water-level indicator on the dash is standard equipment on the new cars, taking the place of the usual heat indicator, which has been dropped with the adoption of thermostatic heat control. Generators are "air-cooled" and provided with voltage regulation, to better take



Direct acting shock absorbers are used front and rear

New Body

By Athel F. Denham

Detroit Editor,
Automotive Industries

care of increased electrical demands with the use of radio, etc.

Starting is now through a simple push-button on the dash, actuating a solenoid on the starter motor. Rear springs are provided with an extra leaf at the rear, above the main leaf, to better resist brake torque.

A new body-ventilating system has been developed. Front-door windows have been divided into halves, the forward half being controlled separate from the rear half. The rear half can be raised and lowered without affecting the forward wing, and irrespective of its position. Moreover, when the front half is closed by means of the crank provided, continuation of the cranking action lowers the forward half independently into the door. It is, therefore, possible to have, in addition to ventilation by a pivoted wing, ventilation through an adjustable opening at the top of the forward half of the window. Rear-mounted spare wheels are now concealed within the body.

Rear fenders are provided with screens back of the wheels, to prevent throwing of mud, stones, etc., against the rear section of the long fenders. Headlamps are of the tri-beam type, with crossed beams (Corcoran) on the Terraplanes and straight-ahead beams (Hall) on the Hudsons. Low-pressure tires are available as optional equipment.

These are just a few of the innovations on the new lines. As a matter of fact, the major mechanical changes are distributed

Lines Offered on '34 Hudson 8 and Terraplane 6 Models

Mechanical refinements aimed at greater ruggedness and reliability—Engines bigger—New ventilation system—Voltage regulation—Low and reverse gears "demesh"—"Axleflex" front suspension is optional

throughout the cars. The unit construction worked out in previous Terraplane series has been further improved and standardized for the Hudson also.

The structural improvements include a new K-type cross member in front, deeper average side-channel section, with triple section near the dash for rigidity at this normally weak point, etc.

A characteristic of recent cars of the Hudson company has been that they looked light, which was due principally to the sheet-metal treatment. This has now been completely changed. The new cars look materially heavier than they actually are, the treatment of the sheet metal in them being superior to that on any previous Hudson model.

The Terraplane six now comes with 112 and 116 in. wheelbases, against 106 and 113 in. last year, the Hudson eight with wheelbases of 116 and 123 in., as compared with 119 and 132 in. in 1933. It is expected that prices will be raised, but

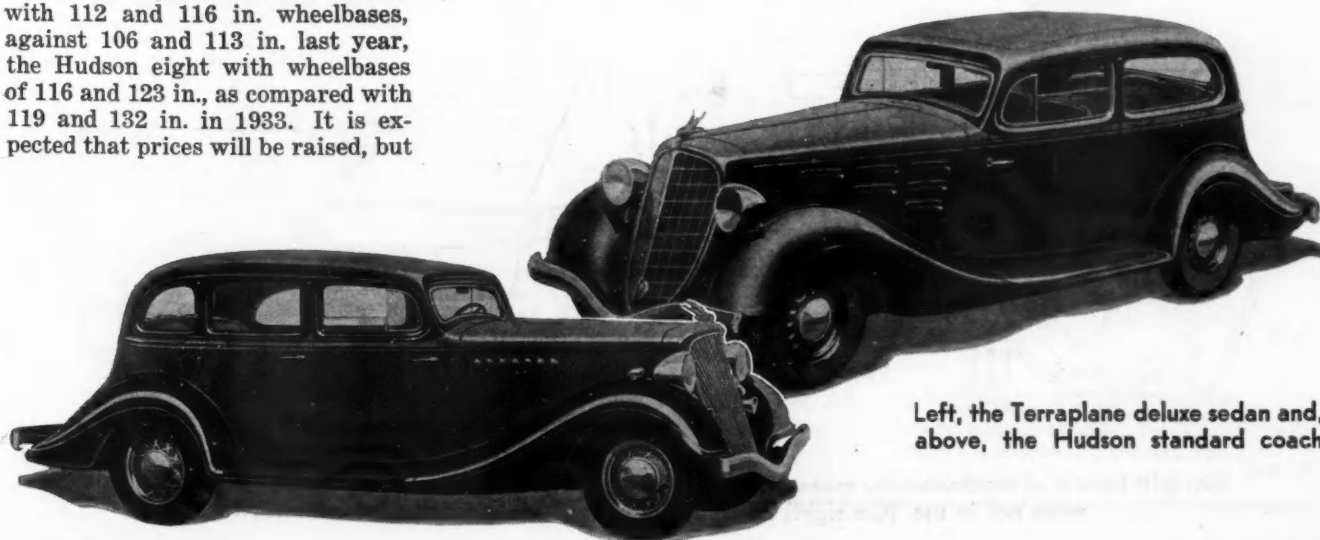
according to President Roy Chapin, it is planned to turn out 200,000 cars the coming year, and to create a market for such a number it would seem essential to hold the increases down to the minimum.

With the increase in car size, engine power has been further increased. The Terraplane six has an entirely new block with 3 by 5-in. cylinders, as compared with 2 15/16 x 4 3/4 in. last year. Main bearings are longer than heretofore. The bore and stroke (3 x 4 1/2 in.) of the Hudson Eight engine are the same as in 1933. Horse powers have been increased more than 10 per cent, it is claimed. With a composite aluminum-and-iron head (which is standard equipment on deluxe models), the six is said to

develop 85 hp. at 3600 r.p.m., while the output of the eight, with the same equipment, is given as 113 hp. at 3800 r.p.m. These powers are obtained with non-premium fuels.

A Super-Power dome with a compression ratio of 7.1 is also available on both lines at extra cost; with it the six develops virtually 90 hp. and the eight, 121 hp. With this head the Hudson eight roadster has a weight/power ratio of only 24 lb. per hp.

Deluxe models come on the longer wheelbases (116 in. for the Terraplane and 123 in. for the Hudson). Both are equipped with the Power-Dome head.



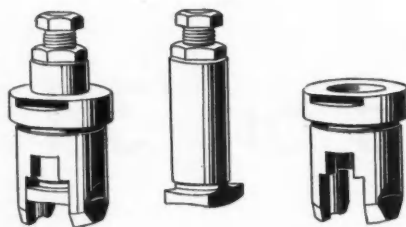
Left, the Terraplane deluxe sedan and, above, the Hudson standard coach

Internal engine changes include the adoption of eight integral counterweights on the six-cylinder crankshaft. Main bearings are larger and the crankshaft is heavier and more rigid. Torsional vibration dampers are now located back of the fan pulley.

An improvement in the engine rear mounting has been worked out. Two arms project from the frame against the transmission case. Interposed between the two are blocks of live rubber which dampen transmission movement and vibration. These arms can be adjusted to vary the damping action for each individual car and by each owner.

Cylinder-head gaskets are now of steel, with an asbestos filler, as a protection against oxidation of the edges of gaskets. The practice of pinning the piston rings in the pistons, adopted during the past season, is continued. Cast alloy iron camshafts also are continued, and are driven by a composition gear.

The increase in engine power of both engines is partly due to a new form of tappet, which, instead of being flat, has a 3-in. radius. While not increasing the lift, the shape of the tappet permits a longer "dwell"



This new cam follower is said to be equivalent to a 3-in. roller

in the wide-open position and more rapid opening and closing, thereby increasing the volumetric efficiency of the engine. The design was developed in connection with the Hudson company's work with race cars at Indianapolis during the past two years.

Oil pumps have been more than doubled in capacity. The breathing capacity of the crankcase has been increased by a double breather installation. There are more deflectors in the crankpan around which the oil must flow to return to the pump intake—thereby increasing the cooling of the oil.

The carburetor used on the 1934 models is a combination plain-tube and air-valve design—the air-valve being effective only during warm-up periods. The automatic choke control has a small piston connected to the thermostat element regulating the position of the choke valve. This piston is subject to intake vacuum, so that the actual position of the choke valve is not controlled by temperature alone, but is influenced also by throttle opening. Furthermore, the choke valve is offset, so that a sudden drop in in-

take vacuum permits the choke to close slightly, momentarily enriching the mixture for rapid acceleration before the engine is thoroughly warm.

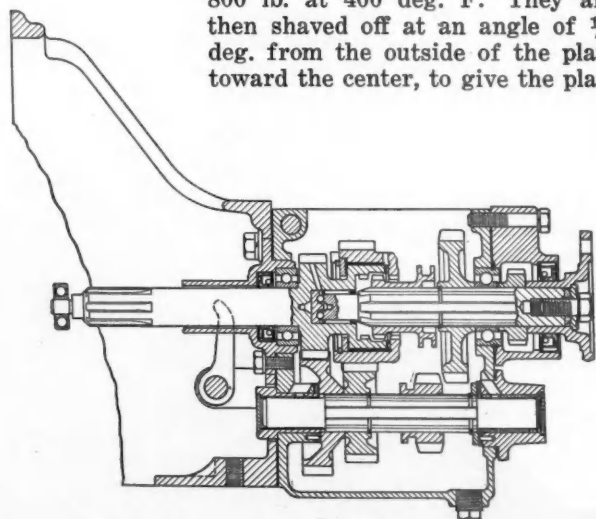
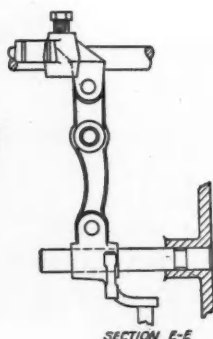
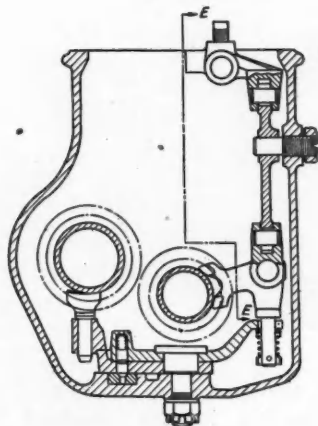
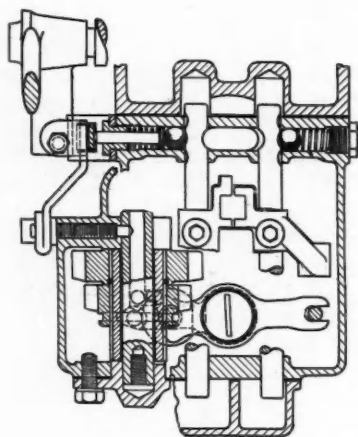
Another device included in the carburetor design, and not previously mentioned, is a dashpot which prevents too rapid closing of the throttle. This has the double effect of preventing "lurching" of the car on sudden release of the accelerator pedal, and of cushioning the action of the automatic clutch when that unit is provided.

A poppet-type back-fire valve is built into the choke to insure against damage to the carburetor in case of back firing while starting, etc. Heat supply to the intake gases is now automatically controlled by another thermostat.

On the 1934 Terraplanes the radiator capacity has been increased 20 per cent. Batteries have been increased in size, those of the Terraplane having 17 plates and those of the Hudsons 19 plates. Batteries have also been moved forward to shorten the leads to the starting motor. Generators, in addition to being "air-cooled," are provided with voltage regulation. The charging rate is higher at high road speeds. There is also a temperature control for charging rate, increasing the rate during cold weather. The new cooling-control thermostat is of the by-pass type, maintaining constant water circulation.

The eights now have a single breaker distributor. Starting cranks are standard equipment once more.

Clutches have a greater number of corks than formerly. Furthermore, they are heat-treated and "riveted" over under a pressure of 800 lb. at 400 deg. F. They are then shaved off at an angle of $\frac{1}{2}$ deg. from the outside of the plate toward the center, to give the plate



(On left) Details of mechanism by means of which low and reverse gears are automatically unmeshed when not in use. (On right) Longitudinal vertical section through transmission

a cushioning action during engagement. Clutch covers are ribbed for rigidity. Flywheels are heavier.

Transmission changes include an automatic double shifting mechanism for completely unmeshing the low and reverse gears on both mainshaft and countershaft when not in use—a design intended to decrease noise with the car in second or direct. The mainshaft pilot bearing is now of the cageless roller type. A ball thrust bearing has been provided between the main shaft and countershaft drive gear. Lubrication has been improved by drilling the constant-mesh gears in such a manner that the meshing of teeth forces oil into the gears and to the bearings on their shafts. A no-back device is available as optional equipment. (Detroit Gear and Machine.)

Propeller shafts have been increased in diameter on both cars, and the bearings in the propulsion system also increased in size, for increased life and reliability. These include a heavier front pinion bearing on all cars, and larger outer wheel bearings on the eight, differential side bearings on all, and heavier pinion cases.

Universal joints, on all models, are of the needle-bearing type.

Steering spindles have been redesigned to provide more support for the front wheel bearings. Tie rods are stiffer than formerly, and the Hudson has ball-bearing tie-rod ends. Wheels and tires are balanced in production.

A change in the suspension system not previously mentioned, is the provision of rubber pads between rear springs and axle pads to reduce road noise. The direct-acting shock absorbers have previously been described in these columns. On the Hudson they are of Spicer, and on the Terraplane of Monroe manufacture. At the front the upper ends of the shock absorbers attach to an unusually rigid fender brace. Springs are lubricated and provided with covers for the first time in Hudson history.

In the braking system, cables now connect to levers above the drum axis for front wheels and below the drum axis for rear wheels, for better equalization. With the wider doors used in 1934 models, the emergency brake lever has been returned to the center of the front compartment. A molded brake lining has been adopted for use on 1934 cars. Rear-wheel brakes are double-sealed against entry of water by the addition of a baffle plate, giving a double overlap at the opening between drum and backing plate.

Reversing the general trend, Hudson offerings for 1934, while appearing lower due to the curvature of the roof, are actually 1½ in. higher than last year, the entire chassis having been raised 1 in. to increase the road clearance. Headroom has been increased in the center of the car, particularly over the rear seat.

Body lines are hard to describe. Attention might be called to the sloping (20 deg.) windshield shown by the illustration, which has now two intermediate positions between full-open and closed; the slanting front-door pillars, panelled fenders, concealed rear mounting for the spare wheel, long hoods, short cowls, new radiator front, with protective screens back of the grilles, and the large and deep front fenders. In case fender wells are specified, the rear compartment can be used for carrying luggage. In that case rear seats are moved ahead 1 in. to give increased luggage-compartment room. This compartment is provided with a light which can be controlled manually by means of a toggle switch but which is turned off automatically when the deck is lowered.

Interior changes include deeper upholstery, 4-in. adjustment for sliding front cross seats, a right-hand bucket seat in two-door models which slides forward parallel with the floor to permit entrance to the rear without the front passenger

having to get out of the car; a larger cowl ventilator; a new instrument panel with all instruments under one glass, including the warning lights for generator charging rate and oil pressure; a water-level indicator; provision for the installation of a radio set in the center of the panel; a starter button on the dash actuating a solenoid on the starter motor, etc.

The water and gasoline level indicators, incidentally, are of interesting design. Of King-Seeley manufacture, they operate through thermostatic elements heated by the same current. The amount of current or heat is regulated automatically by the frequency of electrical contact made at the input end. This frequency in turn depends on the level of the water or gasoline in their respective tanks. The result is an instrument which is much less sensitive to instantaneous variations of level, as in driving over a rough road.

Rear bumpers have vertical risers to provide protection in case of contact with another car with a bumper at different height. Rear curtains pull up and are translucent, so that headlights of a car to the rear can be distinguished.

Tire equipment on the cars produced by the Hudson company is as follows: Terraplane Deluxe Six, 6.00/16; Terraplane Standard Six, 5.50/17; Hudson Standard and Deluxe Eights, 6.25/16.

CALENDAR OF COMING EVENTS

AUTOMOBILE SHOWS

New York	Jan. 6-13
Toronto, Ont.	Jan. 13-20
Milwaukee, Wis.	Jan. 13-20
Newark, N. J.	Jan. 13-20
Cleveland, Ohio	Jan. 13-20
Buffalo, N. Y.	Jan. 13-20
St. Louis, Mo.	Jan. 14-20
Cincinnati, Ohio	Jan. 14-20
Philadelphia, Pa.	Jan. 15-20
Brooklyn, N. Y.	Jan. 15-20
Detroit, Mich.	Jan. 20-27
Hartford, Conn.	Jan. 20-27
Baltimore, Md.	Jan. 20-27
Boston, Mass.	Jan. 20-27
San Francisco, Calif.	Jan. 20-27
Montreal	Jan. 20-27
Pittsburgh, Pa.	Jan. 20-27
Montreal, Canada	Jan. 20-27
Rochester, N. Y.	Jan. 22-27
Harrisburg, Penna.	Jan. 24-27
Chicago	Jan. 27-Feb. 3
Washington, D. C.	Jan. 27-Feb. 3
Indianapolis	Feb. 3-9
Toledo, Ohio	Feb. 3-9
Camden, N. J.	Feb. 3-10
Los Angeles	Feb. 3-11

Omaha, Neb.	Feb. 5-9
Lansing, Mich.	Feb. 7-10
Rapid City, S. D.	Feb. 7-10
Springfield, Ill.	Feb. 8-10
Kansas City, Mo.	Feb. 10-17
Syracuse, N. Y.	Feb. 10-17
Black Hills, S. D.	Feb. 15-17
Des Moines, Ia.	Feb. 19-24
Evansville, Ind.	Feb. 20-24
Denver, Colo.	Feb. 20-28

OTHER SHOWS

Road Show, Chicago	Jan. 22-27
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CONVENTION AND SHOW

Natl. Assoc. of Engine and Boat Mfrs., New York City	Jan. 19-27
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CONVENTIONS

American Road Builders' Association, Chicago	Jan. 22-27
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MEETINGS

Rubber Assoc. Meeting and Banquet, New York	Jan. 8
S.A.E. Annual Meeting, Detroit	Jan. 22-25
National Automobile Dealers Assoc., Chicago	Jan. 29

Knee Action Front Suspension and More Powerful Chevrolet

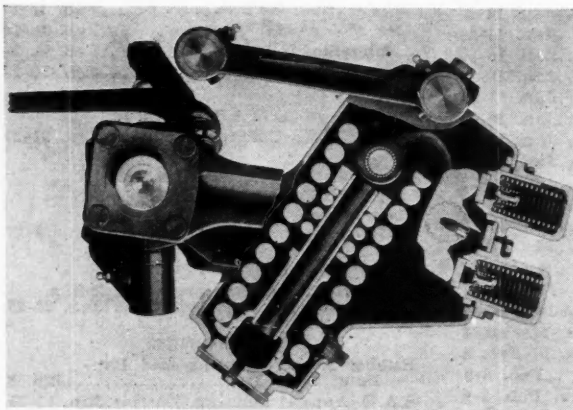
IN addition to independent front-wheel suspension, the 1934 Chevrolet Master Six has a longer wheel-base, more body room, a sturdier frame, and a more powerful engine. Appearance changes are confined for the most part to the front end, where there are a new radiator shell, new fenders, and a longer hood with horizontal louvres of the airfoil type.

The Standard Six will continue to form part of the Chevrolet line, but details regarding this car are not as yet available for publication.

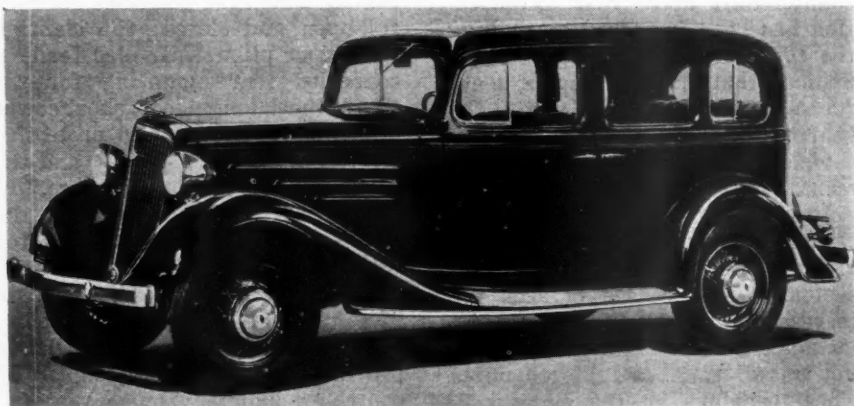
Chevrolet's independent suspension is similar to that employed by Pontiac, which is described elsewhere in this issue. It permits the use of soft, low-rate springs. The steering heads are rigid with the frame, the entire suspension system swinging with the wheels on curves. The suspension housing encloses both coil springs and shock absorbers. Needle bearings are used throughout the suspension system.

"Ducking" of the front end of the car under brake application is prevented by the use of a brake-torque rod connecting the brake backing plate with the suspension housing.

The front-spring rate is now 115 lb. per in. of vertical wheel movement, as against 345 lb. formerly. The difference in softness is even greater than indicated by these figures, because of the fact that the engine is located farther forward and the load on the front springs therefore is greater.



Crank-arm type of front springing with torque link and integral shock absorber



Three-quarter front view of Chevrolet sedan showing new frontal treatment

The suspension system is used in conjunction with a much more rigid frame, referred to as a YK type. It is essentially a modified X-frame, with long forward legs forming a box section with the side rails at and ahead of the dash. Rear legs are shorter and supplemented by straight-across bracing at the junction point of forward and aft legs of the sub-frame. The frame also has a new rear-engine-support cross-member and, of course, a very rigid front cross-member to take the stresses of the suspension system. Side rails are stronger than formerly. Gusseting members are provided between the forward legs of the sub-

frame and the side-rails. Batteries are mounted between side rail and sub-frame at the right.

On the coach and town sedan the rear springs also are softer. These models have an increased overhang of the body at the rear. Coupes have slightly stiffer springs, to conform to the changed load distribution. All springs are provided with fabric-lined metal covers. Rear spring eyes (front) are provided with rubber bushings, while cadmium-plated threaded

bolts and bushings are provided at the shackles. Hollow rubber bumpers of improved design protect the rear of the car against "striking through." The same function is performed at the front end by an auxiliary spring inside of the suspension housing, concentric with the main coil spring.

A new cylinder-head design and valve arrangement is incorporated in the 1934 Chevrolets, and has made it possible to increase the engine output from 65 hp. at 2800 to 80 hp. at 3300 r.p.m. At 2800 r.p.m. the engine develops 76 hp.

The principal change is in the valve arrangement. Valves are now staggered, with the exhaust valve close to the spark plug at one end of the combustion chamber, and the inlet valve at the other end, where it cools the last charge of gas to burn, permitting the use of a 5.45 to 1 compression ratio.

The new arrangement also permitted of an increase in the size of the valves, and the breathing capacity was further increased by increasing the valve lift, this latter being the direct result of a change in the rocker ratio. A new inlet manifold, eliminating the inlet-port sleeves, adds further to the power of the engine by imparting a helical motion to the incoming charge. Pocketing of the spark plug is not a feature of the new combustion chamber.

To further check any tendency toward detonation, the cooling water is introduced into the cylinder-head

On the Bigger Line for 1934

jacket, and is directed toward the exhaust-valve seats, by copper nozzles pressed into the lower wall of the head.

Camshafts are larger in diameter, while the cams have been narrowed to insure rotation of the offset followers. There is a longer ramp on the exhaust cams, permitting an increase in valve-lash when hot.

Provision of a spring between the lower end of the push rod and a stamping bolted to the ledge of the crankcase has permitted of the use of a main valve spring of lower pressure when the valve is closed, thereby increasing valve-seat life. Exhaust and inlet valve springs are rendered interchangeable through the use of a spacer at the inlet guide.

With the new valve arrangement, rocker arms are no longer interchangeable; in fact, there are three different types, one for exhaust valves, and left- and right-hand rockers for inlet valves. The width of the valve seat has been increased, for better cooling, and the inlet-valve guides have been lengthened.

Cylinder bores are honed to a much finer finish than formerly, to increase piston and ring life and reduce the oil consumption. Piston rings are narrower and located farther from

the top of the piston. The cast-iron pistons are cam ground. Piston pins are tempered after carburizing, to relieve heat-treating strains. This is said to eliminate shrinkage and to permit a looser fit in servicing.

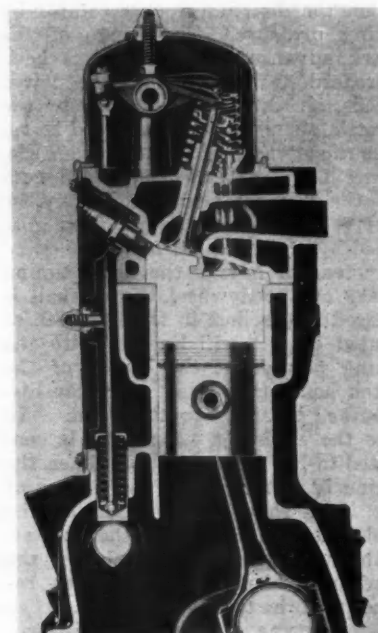
A cylindrical, by-pass type of oil pump screen was adopted during the 1933 season and is continued. It is more easily removed for cleaning.

To compensate for the reduction in oil capacity due to the step in the crankpan at the front end (for steering tie-rod clearance with the new engine location), the oil pan has been made deeper. Embossed beads and a harder paper gasket at the gear-cover joint reduce the chance of oil leakage at this point.

Rubber grommets are now provided on the hold-down studs of the push-rod cover and the valve-rocker cover.

A counterweight is provided to prevent rattling of the thermostatic heat control valve. In the carburetor, hexagonal discs of bakelite are used as check valves for the accelerating pump, for more prompt pump delivery. The idle adjustment has been so changed that operation above 20 m.p.h. is not affected.

To facilitate cold weather starting, the hinged section of the choke valve is permitted to open farther and more

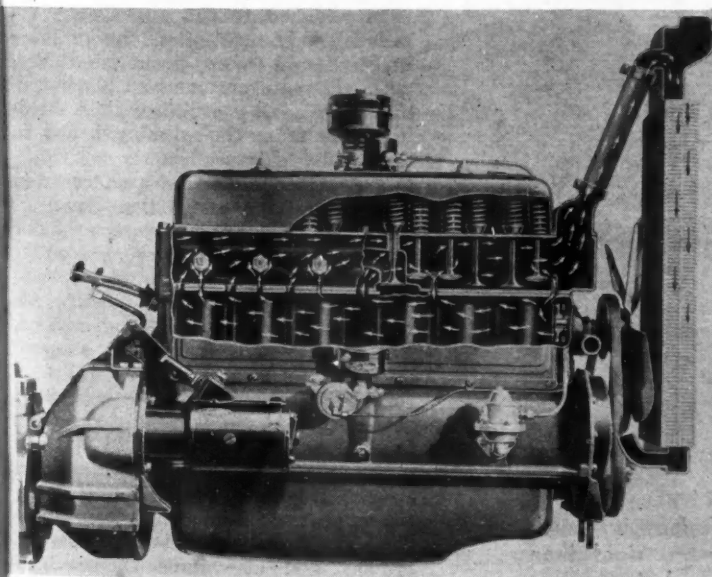


Section of new cylinder head with 5.45 compression ratio

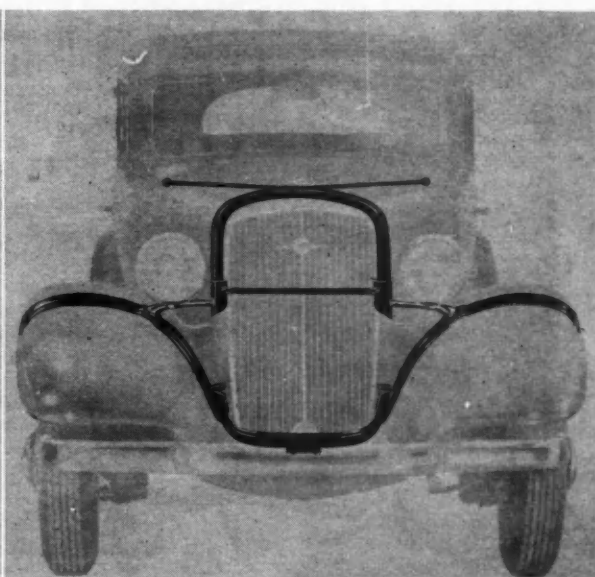
freely when fully choked. As a protection against vapor-lock, the vent hole in the float bowl is made larger. Air cleaners and intake silencers are larger, to correspond to the increased engine output.

The various engine changes, viz., higher compression ratio, improved combustion-chamber shape, modified spark advance, larger valves, and improved carburetor and manifold design, have resulted in a marked improvement in fuel economy, particularly at the higher speed ranges—above 50 m.p.h.

Irregular firing due to excessive clearance or wear in the distributor is avoided by fixing the center about



Cooling water enters the cylinder head through copper nozzles directing it toward the exhaust valves



The fender-support member carries the radiator through connections at the sides

which the distributor cam rotates by spring pressure. The range of the spark advance by vacuum has been increased to 17 deg. at the lower speeds, an air bleed controlled by the throttle opening being provided to reduce the advance at higher car speeds. Above 60 m.p.h. this air bleed cuts out the vacuum advance entirely, so that the spark advance is then governed by engine speed alone.

Instead of having the usual timing marks on the flywheel, a steel ball is pressed into a hole in the flywheel, so located that it will line up with the timing pointer at the center of the clutch housing opening when the distributor breaker points open. To time the engine, a neon light is connected to No. 1 spark plug. When the engine is turning over, the flashes of this light show the position of the steel ball with respect to the pointer. With the engine running slowly, the distributor housing can then be rotated until the timing is correct.

A new type of fuel pump is provided, with the filter chamber located over the diaphragm in a pressed steel cover.

The starter ratio has been increased for better cold weather starting.

Engine mountings are of the five-point type. There are two points of support at the front, on an arc about the neutral axis of the engine; two at the sides of the engine, again on an arc about the neutral axis, and one under the rear of the transmission.

The exhaust system has been redesigned. Exhaust pipes are smaller

in diameter, but made of heavier gage steel, to decrease vibrations, and increase their strength. The new muffler is of the diffusion type, having three tubes with twelve surrounding chambers and a common reversing chamber at each end. The gas passes through the muffler in one pipe, returns to the front end through another, and then flows toward the rear once more, through a third pipe connected to the larger and longer tail pipe. Rubber grommets insulate the exhaust system from the frame at the mounting points.

An entirely new clutch with reinforced steel cover has been adopted. The drive is taken by posts cast on the pressure plate, contacting the sides of broached holes in the clutch cover, which permits more accurate centering. Thus there are no driving slots in the pressure plate. Coil-spring cushioning of the driven plate is retained. Advantages claimed for the new clutch are lighter pedal pressure and increased durability.

To prevent clutch chatter due to torsional vibration of the engine, the clutch pedal linkage has been improved so it is not affected by engine movement. This change was originally made during the 1933 season, but has been further improved.

Transmission changes are confined to detail refinements. Gearshift lever knobs are now entirely of rubber; while hard on the outside, they have a soft core. Instead of being screwed on, these knobs are now applied with a push fit. The design is said to prevent "telephoning" of noise up the lever.

A hard-bronze bushing is pressed into the front of the torque tube to

maintain alignment and prevent propeller-shaft whip at high speeds. Propeller shafts are now made tubular, also as a precaution against whip.

In the rear axles, spring seats, wheel bearings, and brakes are spaced farther apart than formerly, although the tread is unchanged. The effect is to reduce the wheel overhang from the bearing, reducing stresses. Stock of heavier gage is used for the axle-housing cover.

Brake shoes are now of the double articulated type, and shoes are supported by links pivoted to the anchor plate. Lower shoes are longer, providing more contact area. The two shoes now are interchangeable. Linings are molded to the shoe curvature.

Brake control is by cables and rods. The emergency lever cuts in at the cross shaft to operate the brakes at all four wheels. Connection from the cross-shaft levers to where the cables are supported on the frame is by means of rods.

The steering gear on the 1934 Chevrolet is entirely new. It is of the ball-bearing roller-sector type, with an hour-glass worm and ratio of 16 to 1. This increased steering-gear ratio makes the car easier to handle and compensates for the outward lean of the front wheels on curves at high speeds (increasing the natural steering recovery of the car).

Some changes have been made also in car controls. The hand throttle is now completely independent of the "starterator," or coincidental starter, and the hand-brake lever is mounted on the chassis frame, free from vibrations.

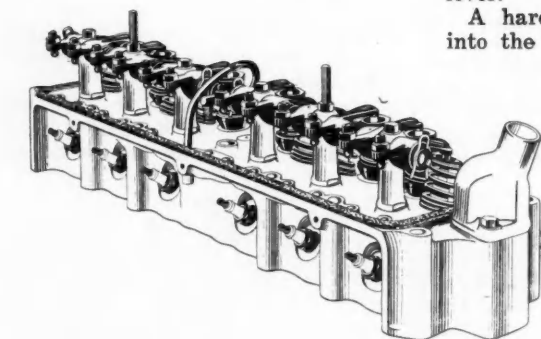
Smaller, 17-in. wire-spoked wheels with wider rims, carry larger-section (5.50-in.) tires. The wider rim permits the mounting of oversize tires. Tire valves are now mounted at an angle, for greater accessibility. A push-on type of valve stem cover is provided. Hub caps are larger in diameter, for better appearance.

In addition to the appearance details already mentioned, the radiator grille has a more pronounced Vee, with alternate chrome and black vertical bars, and a stainless-steel molding runs from the running board to the fender skirts.

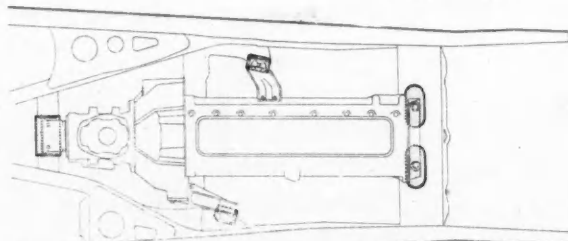
Front fenders are broader and deeper, and extend farther down at the sides. The valley between fender and hood is much shallower. Fender edges are flanged for increased stiffness and to provide an invisible attachment for brackets and braces. The fender support member adopted last year now carries the radiator through connections at the sides, rather than at the bottom of the core, for better bracing.

Hoods are longer and wider, and hood sides have a vertical reinforcing rib to prevent drumming. Rear fenders are broader and have deeper crowns and also have their edges flanged. A baffle is provided behind the wheel to prevent gravel from

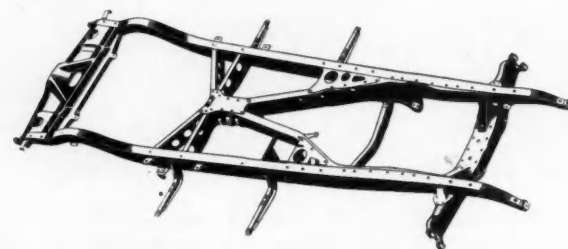
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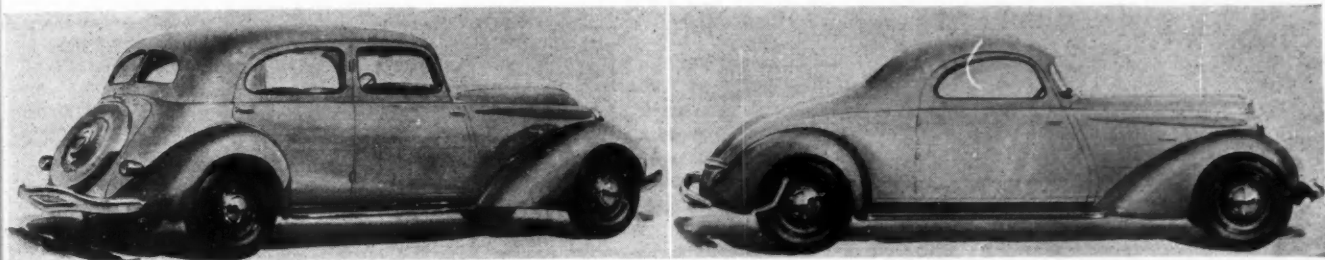
Sketch of the new valve rocker arm arrangement



The power plant is now supported at five points



The new KY frame is much more rigid than last year



Two of the new Hupp "Aerodyne" bodies

Hupp Introduces "Aerodyne" Bodies

Are furnished on eight-cylinder car and on larger six—Low price six bodies follow lines of previous Hupp series more closely

A NEW 117-in. wheelbase Six in a lower priced bracket, a 121-in. wheelbase Six in the neighborhood of \$1000 and a 127-in. wheelbase Eight in the \$1000 to \$1500 field, both of the latter with radically new body lines, comprise the Hupmobile offerings for the 1934 season.

While the lower priced Six with bodies by Murray is attractive in appearance, its size and low price should provide its major appeal. On the two larger cars, however, an entirely new body design which also reflects the hand of Amos Northup, chief designer of the Murray Corporation, provides an individuality of appearance which readily distinguishes these cars from any others to be offered next year.

By providing a curved offset in the front of the hood, the nose of the car is widened and caused to taper off into the body lines at the rear. This gives a front seat of sufficient width to accommodate three passengers. Since the bodies are somewhat narrower at the rear than at the front, the cars should have a relatively low wind resistance.

The lines of the low-priced Six follow those of the previous series of Hupmobile models more closely, with a massive front and relatively short front fenders, separate from the running board. Rear panels are provided with a considerable backward slope, in line with the modern trend. Horizontal louvers are arranged in four groups.

All three lines of cars incorporate the new Murray ventilating system of the fore-and-aft sliding window type. If the front windows are cranked up, another turn of the handle slides them back for a space of approximately 1½ in., permitting air to be drawn

out of the car. Rear windows in sedans slide back and forth when the crank is turned, permitting air to be sucked out of the body by vacuum at the front, or blown into the car at the rear, as the case may be.

The 117-in. wheelbase six-cylinder model has an entirely new engine with the bore and stroke nearly equal, 3½ x 3¾ in. With a piston displacement of 224 cu. in. it is claimed to develop 80 hp. at 3400 r.p.m. Its compression ratio is 5.3 to one. Pistons are of the invar-strut, aluminum-alloy type and are cam-ground to permit of fitting to a close clearance. Two oil rings and two compression rings are provided.

Replaceable steel-back, babbitt liners are fitted in the lower ends of connecting rods. Counterweights are integral on the four-bearing shaft, whose journals are stepped from front to rear for line-reaming of bearings on installation. All bearings are 2½ in. in diameter or over.

The camshaft is driven through a

short Morse chain, while accessories drive is through the fan belt. Valve lift is 11/32-in., which is fairly high. Piston-pin bearings are lubricated under pressure through drilled connecting rods. The fuel system incorporates a Stromberg 1½-in. down-draft carburetor equipped with automatic heat control and a camshaft-driven fuel pump.

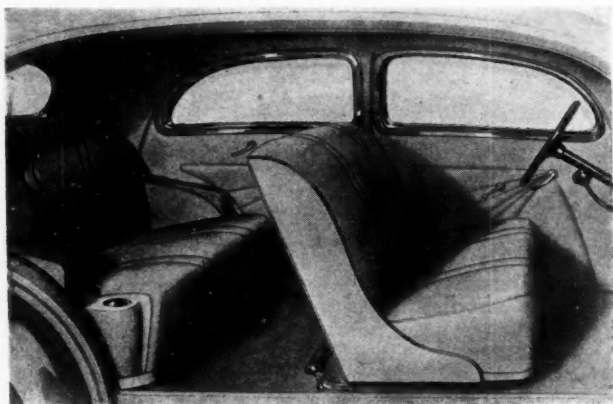
The water pump is integral with the fan. The cooling system incorporates a by-pass type of thermostat to insure continuous circulation even during the warm-up period. Willard batteries and Autolite electrical units comprise the electrical system. The generator, driven by the three-point fan belt, has forced ventilation.

The single-plate clutch, of 9¾-in. diameter, is provided with torsion cushion springs. Transmissions have constant-mesh helical gears for the countershaft drive and second speed, and are provided with synchronizers.

Needle-bearing universal joints by



A three-quarter front view of an "Aerodyne" model



An interior of an "Aerodyne" body and, above, the instrument panel



Universal Products reduce lubrication requirements. An optional ratio of 4.7 to one is available in the semi-floating axles, the standard ratio being 4.363 to one. Final drive gears are of the hypoid type which has been used by Hupmobile in its higher-priced cars in recent years.

Front springs are 42 in. long and quite soft. These as well as the 54-in. rear springs are of chrome-manganese steel. They are mounted in threaded-U shackles.

The side-sway eliminator introduced by Hupmobile a year ago, and which will be found on a number of other makes this year, is, of course, found also on this model. It permits of the use of soft springs without incurring risks of excessive side-sway on curves at high speed.

Hupmobile's chassis stabilizer, consisting of a truss structure ahead of the dash to the front end of the car, is duplicated in the new Six. In addition, this stabilizer also supports the front fenders, tying them in rigidly with the body structure. The design of the "chassis stabilizer" is claimed to have done much toward the complete elimination of shimmy and wander in Hupmobile cars.

Front axles are tubular. Brakes are mechanically operated, as formerly, with 11-in. drums, 1 3/4 in. wide.

Frames are of the X-member type and have channel-type cross-members at front and rear. Bodies, which are largely of steel construction, are bolted to the frame at a large number of points. Tires are 6.50/16-in. and are mounted on either wire or steel-spoke wheels.

The two larger cars are to be merchandised as having "aerodyne lines." They differ mainly as to wheelbase, frame and hood length, engine, accessories and trimming. Engines represent a further development of the six- and eight-cylinder engines used in last year's series.

There has been an increase of 1/8 in. in the bore of the Six, giving cylinder dimensions of 3 1/2 x 4 1/4 in., increasing the horsepower output to 93 at 3400 r.p.m. It has a new crankshaft with integral counterweights, seven in number, as against four previously.

The eight-cylinder engine has a bore and stroke of 3 3/16 x 4 3/4 in., the same as last year's larger eight-cylinder engine, and develops 115 hp. at 3500 r.p.m. as against 109 hp. for the largest Hupp eight last year.

In both engines the cylinder bores have a much finer finish, which with lighter, aluminum-alloy, cam-ground pistons, is estimated by Hupp engineers to increase the life of rings and pistons some 5000 to 10,000 miles. Connecting rods in both engines now have replaceable liners of the steel-backed, babbitt-lined type in their lower bores.

The valve mechanism in both engines has been changed somewhat. The chain drive is now of the two-point type, driving only the camshafts, and the accessories drive is through the fan belt.

Valves of a new silicon-chromium alloy, together with the use of alloy iron in the cylinder-block casting, materially increase the life of exhaust-valve seats.

Water pump and radiator capacities have been increased, and the fan pulley is now carried on ball bearings of the radial-thrust type, to prevent end play resulting from lack of lubrication.

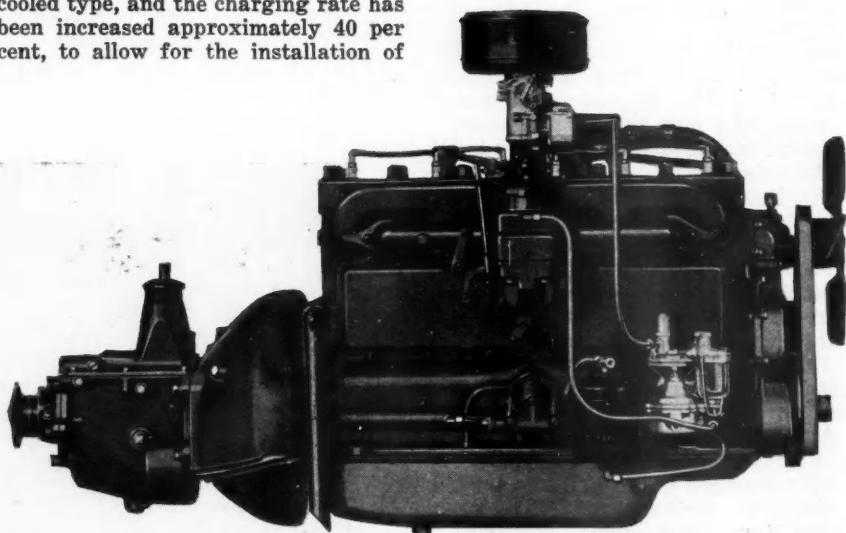
Generators are now of the fan cooled type, and the charging rate has been increased approximately 40 per cent, to allow for the installation of

radio. Starters are equipped with solenoid switches energized by a push-button on the dash.

A new, four-point engine mounting has been developed. The engine is supported on rubber-bushed links similar to spring shackles. The center lines of these links, at the rear as well as the front, intersect at a point which lies on the neutral axis of the engine—a line virtually parallel to the crankshaft and passing through the center of gravity. The arrangement permits the engine considerable freedom of oscillation about its neutral axis, while the non-symmetric motion of the "shackles" provides a snubbing action that damps out such vibrations without transmitting them to the chassis.

In both the series J (121-in. wheelbase Six) and the series T (127-in. wheelbase Straight Eight) clutches have been improved by the addition of knife-edge fulcrums in the release mechanism, to lower the pedal pressure.

The flexibility of the front springs has been materially increased in both lines, and this is claimed to have greatly improved the rear-seat ride. All springs have been increased in length, with a view to further improving the riding qualities. Hupmobile's use of the chassis-stabilizer construction ahead of the dash, which has now been extended to include the fenders, and the sidesway eliminator at the rear are credited with making this possible without introducing in-



The new power plant in the 117-in. Hupp six

stability. Shock absorbers are provided with thermostatic control.

Front axles are tubular; rear axles retain the hypoid drive, frames are of the X-member type, and brakes are mechanically actuated, as last year. Needle-bearing universal joints are provided.

Three body models are offered on both chassis, viz., a six-passenger sedan, a five-passenger victoria (three in front seat also), and a three-to-five-passenger coupe with rumble seat.

An important feature of the new bodies is improved visibility due to the adoption of a three-piece windshield. The sloping center portion of the windshield is supplemented by two "wings" at an angle to the center section. The windshield assembly as a whole is closer to the driver than usual, thus further eliminating blind spots.

Unusual width of doors (particularly the rear doors) has made it possible to eliminate one body pillar at each side, without introducing a seriously "blind" rear quarter. The design permits an increase in structural body strength and material reduction in weight. Rear windows are split in the center and quite large, to increase visibility in this direction.

Another feature of the car is its rear luggage compartment, back of the rear seat, with access through a door in the rear deck. Recessed into this door is the spare wheel, with metal cover. Headlamps are recessed into the hood offset and eliminate the usual gap between fender and hood.

Bodies are virtually of all-steel construction. By moving the radiator and engine forward and recessing the dash, it has been possible to move the body forward so that the rear seat is ahead of the rear axle. Elimination of body sills has reduced the over-all height of the car.

The front of the dash inside the outer body panels has been cut away at both lower corners, to permit hot air to escape from under the hood without the use of hood louvers. The dash, of course, is insulated to keep engine heat out of the body.

Front seats are approximately 6 in. wider than on former Hupmobile models and are adjustable fore and aft through a range of 4 in.

New Chevrolet

(Continued from page 24)

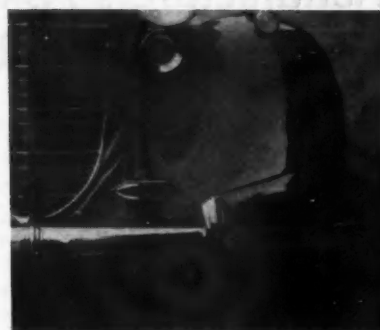
striking the tail of the rear fender.

Batteries, while of the same size and rating as formerly, now have 15 plates. This change has increased the maximum discharge rate, which improves cold-weather starting. The Tilray headlamps use pre-focused bulbs. The candlepower of the filament for the upper beam has been increased to 32. To offset the increased current consumption, the headlamps,

Company Headed by H. O. Smith Brings Out Turnsignal

A signalling device for automobiles which is intended to indicate to the driver behind when the car in front of him is about to turn either to the right or left and also to indicate the driver's intentions to pedestrians ahead of the car, has been developed and placed on the market by the Turnsignal Corporation, 410 East Rittenhouse Street, Philadelphia. Three well-known automobile men are at the head of this corporation. H. O. Smith, formerly president of the Premier Motor Car Co., is president, and Howard E. Coffin and Wm. B. Mayo are vice-presidents.

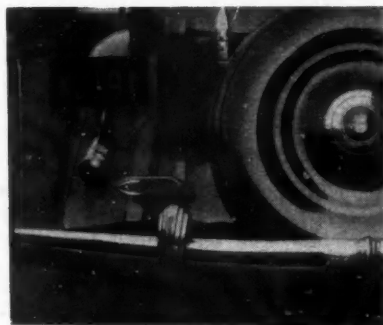
Views of the signal as applied to the front and rear of the car are shown herewith. The bulbs of the signal are enclosed in a sheet-metal housing with an opaque cover in



Turnsignal mounted on front of car.

which there are four transparent louvers, two and two of which form a sort of arrowhead. One of the arrowheads points toward the left and the other to the right. When the driver wants to turn in either direction, he turns a switch conveniently placed on the steering post, in that direction, and the corresponding arrowhead then is not only lit up, but the light is turned on and off automatically, thus giving a series of flashes which cannot be overlooked. The signal at the front serves to give notice to pedestrians who may be about to cross a street, that the driver is about to turn into that street.

The instrument is of neat design and when not lit up is quite inconspicuous on the car.



Turnsignal mounted on rear of car.

when switched on, cut out a resistance in the generator circuit, permitting an increased charging rate.

The instrument panel is of new design with a large locking glove compartment at the right. The speedometer has a larger face. The gasoline gage and temperature indicator are combined at the left, the ammeter and oil gage at the right.

Radiators now are provided with copper cores, to increase the cooling capacity in proportion to the increase in engine output. A Vee-shaped baffle in the header tank tends to prevent turbulence therein and to speed the flow of the water through the core.

Moving the engine forward and increasing the rear overhang slightly has resulted in considerably more increase in body room than is indicated by the increase in wheelbase. There is 1 1/4 in. more leg room in front and 2 1/2 in. more in the rear.

Cowl ventilators now open toward the rear, as in other General Motors 1934 cars. No-draft ventilator wings are wider and are provided with a deflector at the top to permit a slight opening during rainy weather, and to exclude downward drafts.

Left front doors in all closed bodies have built-in arm rests.

Body models include the sedan, coach, town sedan, business coupe,

sport coupe with rumble seat, cabriolet and sport roadster. The phaeton has been dropped. A sedan delivery, formerly supplied on the commercial (1/2 ton) chassis, is now available on the passenger-car chassis.

Wholesalers to Discuss Manufacturers' Relations

CHICAGO—A meeting of the executive committee of the Motor and Equipment Wholesalers' Association will be held at the Hotel Gotham in New York City on Jan. 9, during the National Automobile Show. E. T. Satchell, president of the association; B. W. Ruark, general manager, and other officials who will attend the sessions will make their New York headquarters during show week at the Gotham.

One of the principal topics to be discussed will be the recommendations of the M.E.W.A. manufacturers' relations committee with respect to the manufacturers' product group codes. Consideration will be given to a program of further contact with manufacturers and NRA officials on certain provisions in some of the proposed codes for the manufacturers.

Manufacturers Ask Study of Industrial Relations Before Revision of N. R. A.

**Labor Would Outlaw Company Unions.
Small Business Advocates Seek
Protection Against Monopolies**

WASHINGTON—In anticipation of possible revision of N.R.A., the National Association of Manufacturers has petitioned Congress to make an investigation of employer-employee relations before taking up any further legislation on the subject. The petition declares that the proposal of Senator Wagner to broaden the authority of the National Labor Board presents "issues of peculiar gravity at this time."

In proposing an impartial investigation by a qualified Congressional committee, the Association suggests that it be authorized to report upon:

(a) The facts as to the nature of employment relations in industry and commerce, the viewpoint of employers and employees, the number of employees dealing individually or through various forms of collective bargaining with employers, and the prevailing characteristics of such forms.

(b) The nature and extent of Federal authority to deal with employment relations in industry and commerce.

The petition points out that recovery legislation has been in effect but six months and that the need of haste in enactment does not apply to amendment. Time, it is urged, should now be taken to ascertain the facts suggested, the authority of Congress and the quality and operating effect of the present administrative agencies, before drastic amendment is considered.

"The impression is constantly, but erroneously created that the only coercion existing in the field of employment relations is that alleged to be exercised by the employer over his employees," the petition declares. "Any legislation which is not predicated on inquiry into other demonstrable forms of coercion against employees, employers and the public by labor combinations will disregard our social history and experience, the familiar facts of our daily life and be grossly unjust to employers, employees and the people."

Criticism by Progressive Republicans and organized labor apparently is an outstanding reason for plans of President Roosevelt which look to revision of N.R.A. at an early date. Led by Senator Borah of Idaho and Senator Nye of North Dakota, the act has been assailed as setting up monopolies in favor of big business to the disadvantage of small business and consumers. Organized labor is dissatisfied with the collective bargaining section and wants the power of the National Labor Board strength-

ened. It is contended that the Board has been unable to compel "fair elections" among employees to choose their own representatives to deal with employers. While the National Labor Board was supposedly strengthened by a recent executive order of the President, aimed to give it authority for its past and future acts, there appears to be a growing realization that this alone cannot clothe it with the power which organized labor and its representatives on the Board want it to have.

(Turn to page 31)

Shaw Appointed Head of Oldsmobile Eastern Sales

Appointment of R. M. W. Shaw as assistant general sales manager for Oldsmobile was announced today by D. E. Ralston, vice-president and general salesmanager of Olds Motor Works. Assuming his new responsibilities immediately, Mr. Shaw will



R. M. W. Shaw

devote the major part of his attention to the eastern half of the United States.

Mr. Shaw brings to his new position an unusually broad experience, having served both as a sales executive in the central office and as regional manager in the field. Prior to that time he held the position of advertising manager for Oldsmobile for a number of years.

H. A. Trevellyan, assistant general salesmanager, is responsible for territory in the western half of the United States.

NEW

\$500,000 Appropriated For Cheap Airplanes

**Commerce Department
Gets P.W.A. Allotment for
\$700 Plane Development**

WASHINGTON—An allotment of \$500,000 to the Aeronautics Branch, Department of Commerce, for the development of inexpensive, volume-produced airplanes for private flying purposes has been made by the Public Works Administration. Confidence has been expressed by the Department of Commerce that 10,000 of the planes, to cost about \$700 each, could be sold each year after they are on the market. The Department bases its view on a list of some 50,000 prospects which has been collected through a questionnaire.

According to the Aeronautics Branch, private flying is on the decline in the United States, and it is believed that present prices for planes are one of the chief causes of this decline. It is the plan of the Aeronautics Branch, in cooperation with other agencies and technical resources, to develop a type of a small plane which later could be sold to the public at an agreed-upon price.

It is believed that the allotment will provide sufficient funds for working out a design that will be safe, durable and cheap enough to attract a substantial number of purchasers. It is proposed that the government work to perfect the designs of the plane which would be available to private manufacturers for use of citizens seeking inexpensive planes.

Motor Vehicle Taxes Highest Ever in 1933

NEW YORK—Special motor vehicle taxes for 1933 set an all-time record high of approximately \$1,175,000,000, an average of \$56 for every vehicle registered, according to figures compiled by the National Automobile Chamber of Commerce. The Federal government added around \$267,000 to the tax bill, while gasoline taxes alone amounted to nearly a billion dollars.

WS

Radical Design Departures Expected to Attract Big Crowds to N. Y. Show

Early Ticket Sales Running Ahead of Last Year — John Kennedy to Be Feature Speaker at S.A.E. and N.A.C.C. Banquets—International Day Scheduled for Foreign Guests

NEW YORK—The National Automobile Show, scheduled to open here January 6, under the direction of Alfred Reeves, show manager, promises to be the most interesting exhibition ever staged by the National Automobile Chamber of Commerce. With such radical departures as independent front wheel suspension, real streamlining, superchargers, etc., to feature in their displays, advance reports indicate that the manufacturers have taken full advantage of their opportunity to present exhibits that will dramatize automotive progress in a way that will grip the interest of the public. Early ticket sales are running ahead of last year, which is taken as an omen of capacity attendance.

A list of show week events follows:

Friday, January 5

10:00 A.M. Auburn Pre-Show Meeting of Distributors & Dealers, 116 W. 56th St.
Stutz Pre-Show Dealer Meeting, 239 W. 56th St.
N.A.D.A. Meeting, Hotel Pennsylvania.

Saturday, January 6

10:30 A.M. International Day Registration, N.A.C.C. Offices.

Monday, January 8

9:30 A.M. A.A.A. Contest Board Meeting, Hotel Pennsylvania.
9:30 A.M.—
5:00 P.M. Packard Dealer Meeting and Luncheon, Hotel Roosevelt.

10:00 A.M. N.A.D.A. Directors' Meeting, Hotel Pennsylvania.
10:00 A.M. Reo Motor Meeting, 625 W. 55th St.
10:00 A.M. Auburn Dealer - Salesmen's Breakfast, Hotel Commodore.
11:00 A.M. N.A.C.C. International Day Registration, Hotel Ambassador.
12:30 P.M. N.A.C.C. International Day Luncheon, Hotel Ambassador.
1:00 P.M. N.A.D.A. Sectional Convention, Hotel Pennsylvania.
2:30 P.M. N.A.C.C. Motor Truck Committee Meeting, N.A.C.C. Offices.
6:30 P.M. Society of Automotive Engineers Dinner. John Kennedy and Capt. Willemsse, speakers, Hotel Commodore.

Tuesday, January 9

9:30 A.M. A.A.A. Board of Directors Meeting, Hotel Pennsylvania.
12:00 Noon Pierce-Arrow Luncheon, Hotel Commodore.
12:00 Noon Buick-Pontiac Dealer Luncheon, Hotel Commodore.
12:30 P.M. Graham-Paige Dealer Luncheon, Hotel Biltmore.
12:30 P.M. Oldsmobile Dealer Luncheon, Hotel Roosevelt.
12:30 P.M. Internat'l Assn. Auto Show and Assn. Mgrs., Hotel Commodore.
2:00 P.M. N.A.C.C. Export Managers Meeting, N.A.C.C. Offices.
6:30 P.M. N.A.C.C. Banquet. John Kennedy and "Senator" Ford, speakers, Hotel Commodore.

Wednesday, January 10

10:00 A.M. N.A.C.C. Directors' Meeting, N.A.C.C. Offices.
10:00 A.M. Motorcycle & Allied Trades Ass'n Annual Meeting, Hotel Lexington.
7:00 P.M. Automotive Boosters Club No. 13 Dinner & Boxing Show, Park Central Hotel.

Thursday, January 11

12:15 P.M. Overseas Automotive Club Luncheon, Hotel Lexington.

McLean Made Adv. Mgr. of Fisher Body Corp.

DETROIT—W. A. Fisher, president of Fisher Body Corp., has announced the appointment of W. S. McLean as director of advertising of the Fisher Body Corp., effective Jan. 1, succeeding H. J. Henderson, who resigned to become vice-president of the *American Weekly*. Mr. McLean has been



W. S. McLean

assistant director of advertising for more than six years, coming to Fisher Body from the Ford Motor Co. of Boston, where he was in charge of the Lincoln car merchandising division of the New England States.

Public Works Highway Building Well Advanced

WASHINGTON—The end of the year 1933 finds public works highway construction well advanced with contracts still being let at high speed in spite of winter weather, according to Bureau of Public Roads progress reports.

Men reported at work on public works highways on Dec. 23 totaled 128,653. This is the employment on that part of the public works program under the supervision of the Bureau of Public Roads operating according to provisions of the National Industrial Recovery Act allotting \$400,000,000 for emergency construction of highways.

Work already advertised for contract and started by day labor em-

ployed directly by the highway authorities amounts to 59 per cent of the allotment. The high speed at which construction contracts have been let indicates that within a few months men will be at work on projects that take up the entire allotment, highway officials report.

Awards of contracts for construction and grants of money for day labor road work amount to \$212,948,000. This work is in the construction stage.

Projects completed under the program total 430, involving an expenditure of \$10,961,000.

The peak of employment under the Bureau of Public Roads program is expected in the spring and early summer of 1934.

George Lord Goes With Castle Films

NEW YORK—Castle Films, producers of business motion pictures, announce the appointment of George F. Lord, nationally known advertising and sales executive, to their New York staff.

Lord was formerly director of advertising-manager of E. I. duPont De Nemours & Co. He was at one time advertising manager of Chevrolet and later of Durant Motors. In his previous capacities he had wide experience with advertising motion pictures, having been one of the pioneers in adapting this medium for advertising and sales promotion work.

1933 Truck Production Showed Gain of 48%

NEW YORK—About 363,000 motor trucks were produced by American manufacturers last year as compared with 237,000 units for 1932, an increase of 48 per cent. This marks the first increase for a 12-month period since 1929.

According to N.A.C.C. estimates the wholesale value of domestic truck production in 1933 was \$175,000,000. Average factory price was \$645 per unit.

In 1933 contributions by motor trucks in taxes were about \$295,000,000. This represents over one-quarter of the entire motor vehicle tax bill although trucks represent only one-eighth of the vehicles registered.

Organize Committee for Diesel Fuel Study

Oil Companies Plan to Facilitate Investigation of Ignition Qualities

WOOD RIVER, Ill.—To expedite the investigation of the relative ignition qualities of diesel fuels, a volunteer committee headed by T. B. Rendel of the Shell Petroleum Corp. was recently organized.

It is not the committee's intention to encroach upon work being carried out by recognized committees of the various societies such as the A.S.M.E. and the A.S.T.M. However, it is felt that the delays caused by the difficulties that were encountered in obtaining necessary funds to carry out any large program of diesel fuel research could, to some extent, be minimized by a small group of men carrying out a cooperative program in their own laboratories. The work can be later extended and sponsored by a suitable recognized society committee.

A list of the members of the committee is given below:

T. B. Rendel, Chairman, Shell Petroleum Corp.; A. E. Becker, Std. Oil Development Co.; F. T. Berliner, E. I. DuPont de Nemours & Co.; J. Kuttner, New York City; T. A. Boyd, Gen. Motors Res. Lab.; J. C. Geniesse, Atlantic Refining Co.; K. L. Hollister, The Texas Co.; C. H. Schlesman, Socony-Vacuum Corp.; W. H. Hubner, Universal Oil Products Co.; L. C. Lichty, Yale University; H. L. Horning, Waukesha Motor Co.; H. G. Vesper, Std. Oil Co. of California; D. P. Barnard, Std. Oil Co. of Indiana; H. K. Cummings, Bureau of Standards.

This committee has so far held one meeting at which it was agreed to circulate among the members ten samples to be rated for ignition quality in the C. F. R. engine by the method suggested by Messrs. Pope and Murdock in their paper entitled "Compression Ignition Characteristics of Diesel Fuels," published in the S.A.E. Journal for March, 1932. It is later planned to investigate the results obtained in an improved type of cylinder and cylinder head which has been developed by the Shell Company and the Waukesha Motor Company.

Motor Wheel Corp. Business Doubled in 1933

LANISING—Business of the Motor Wheel Corporation doubled during the past year and prospects for 1934 are unusually bright, according to Harry F. Harper, president and general manager.

Highlights in the company's 1933 business, as outlined by Mr. Harper, were:

An increase of 100 per cent in unit volume over 1932 with a correspond-

ing gain in labor employed; a similar growth over 1932 in the hub and drum division, and the acquisition of new equipment accounts.

"Our effort recently," said Mr. Harper, "has been focused on our wheel product for 1934, a great portion of which will consist of our latest creation, the Stamsteel wheel, which consists of a stamped steel spider, produced in various designs, demountable from the hub, with integral rim. This is our chief contribution to the automotive trade for 1934 and I am confident that its introduction will lead to our building up a still greater volume of business."

All Chevrolet Plants Now in Operation

DETROIT—The Chevrolet assembly plant at Janesville, Wis., idle more than a year, resumed operations in December on new 1934 models and is now in production on passenger cars and trucks, with a full quota of about 1,500 workers on the assembly lines and in the adjacent Fisher body plant.

New developments late this year included the erection of new buildings or the utilization of available plant space at the nine domestic assembly plants for the conditioning of new cars before they leave the factory.

Six new buildings were constructed for this work, and a total of about 200,000 square feet of factory floor space was added to the productive capacity of Chevrolet plants.

With the Janesville plant reopened, the company went into 1934 with every one of the 21 domestic manufacturing and assembly plants in its extensive production set-up again in operation.

Bosch Diesel Systems to Be Made in America

SPRINGFIELD, MASS. — Manufacture of Bosch fuel-injection systems for Diesel engines, to supply the markets of the United States and export fields for which this country is a natural supply base, has been transferred from the Robert Bosch plant in Stuttgart, Germany, to the United American Bosch Corp.'s plant here. The present rate of sales for territory to be served from here is at the rate of approximately \$250,000 a year and is constantly increasing. New equipment has been installed to meet production requirements.

Black Back With Ford

DETROIT—Automotive circles are very much interested in the report that Fred L. Black, formerly advertising manager for the Ford Motor Co., has rejoined the Ford organization. No announcement has been made concerning his new duties with the company.

Early Activity Expected In Steel Purchasing

1933 Estimates Show Automotive Makers Took One-Fifth of All Steel Rolled

NEW YORK, Jan. 4—As had been generally expected in the steel market, the new year's first week yielded little in the way of fresh developments. On the production end it was largely a case of marking time, finishing mills stepping down their rate of production which had been abnormally high during the last fortnight of the old year as a result of the code ruling that shipments on account of fourth quarter contracts had to be completed by Dec. 31.

Several plans are being suggested with a view to mitigating the hardships accruing to steel producers as a result of this regulation, one of these being that shipments of a fifth to a third of the total bookings for any quarter should be permitted in the month following. Another is to abrogate quarterly contracts altogether and substitute for them commitments covering six months.

Estimates of steel consumption in 1933, so far published, are in agreement that automotive consumption again led all other steel outlets, having absorbed better than one-fifth of all steel rolled. On the basis of these estimates, the position of the automotive industries as the paramount consumer of flat steel may be said to have become even more pronounced than it had been in preceding years.

While a good many automotive buyers have undoubtedly accumulated large stocks of steel products for their 1934 initial operations, a general buying movement is looked for to develop within the next few weeks and, conservative as steel producers have grown in their expectations, they refrain from predicting any definite rate of operations by Feb. 1, but express encouragement over the outlook as the result of the potential demand in sight.

Pig Iron—Business, following the New Year holiday, was slow in getting under way. With blast furnace activity held down to demand and stocks generally adjusted to balanced market conditions, the situation is very orderly. Prices are unchanged.

Aluminum—Quiet and unchanged.

Copper—Rumor has it that several weeks will elapse before the copper industry's code reaches a stage when its acceptance by all branches of the industry and the NRA can be expected. Meanwhile the market rules rather dull and unchanged. Fabricating mills have a fair nest-egg of automotive business for a 1934 start.

Tin—London Metal Exchange cables early this week indicated an easier tendency. The Straits market here opened at 53.20c.

Lead—The leading interest announced on Tuesday a \$3 per ton cut in its contract price, bringing the quotation down to 4c., New York.

Zinc—Fractionally lower and dull.

Bendix Looks for Good First Quarter

Predicts Production of 2,250,000 for 1934

CHICAGO—Basing his estimates largely on the orders and releases of his company for January and February, Vincent Bendix, president of the Bendix Aviation Corporation, predicts automobile production on a relatively large scale during the first quarter of 1934.

"Comparison with 1933," said Mr. Bendix, "would indicate a production of 2,250,000 automobiles this year, perhaps more. The business is in the healthiest condition it has known for years. Manufacturers and dealers are sold out in many instances. The shortage of new cars together with the influence of new styling and new and valuable mechanical improvements will greatly increase buying.

"The NRA, an important feature of the National program, is a new experiment and must of necessity involve mistakes and changes. From it, however, many benefits can be derived when it is seasoned and certain difficulties have been adjusted or eliminated.

"With the improvement to come in 1934 I look for a great advance in aviation.

"The Bendix Corporation finished 1933 with a profit greater than its losses for 1932."

Ask Study of N.R.A.

(Continued from page 28)

Legislation to strengthen the power of the National Labor Board is said to have been urged by organized labor because it feels that there is grave doubt as to its authority to compel elections under its own supervision for the purpose of establishing the right of collective bargaining. Senator Wagner, chairman of the Board, and sponsor of the Recovery act, apparently shares this view, and it is said to have been brought to a focus in connection with the Weirton Steel Co. and the Budd Mfg. Co. cases. While action through the Department of Justice has been threatened in the former case and similar gestures have been indicated in the latter case, there are many who doubt that it will be or can be enforced. Both companies differ decidedly with the Board as to the conduct of "fair elections" and maintain they have been held fairly and resulted strongly in favor of representation through company organizations.

There is likewise doubt as to whether legislation could be enacted that would abolish the so-called company union. It is contended that it would be in violation of the constitution. Nevertheless, Senator Wagner has drafted for introduction in Congress an amendment to Section 7-a (collective bargaining) of the Recov-

Continental is concentrating on the Beacon line in 1934. The illustration shows the new two-door sedan.



ery act, which, in his opinion, would insure so-called "freedom of contract" to labor. Industrial interests contend that such power already exists. Senator Wagner's measure, details of which have not been disclosed, is said to propose congressional authority to compel fair elections upon complaint of employees of alleged coercion or against company unions. The legislation, if enacted, and if enforceable, would have the effect of completely abolishing company unions and put into the hands of organized labor tremendous power to dominate labor relations with employers. Leaders of organized labor will meet in Washington on Jan. 24 to consider their legislative program, and it is thought to be altogether probable that amendment to the collective bargaining section of the Recovery act such as has been proposed will be recommended.

Senator Wagner is said to have asked the President to relieve him as head of the Board because he feels that he cannot adequately serve both as a Senator and as chairman of the Board. The President is said to be considering his successor.

In order to protect small business and consumers against so-called monopolies under the codes, it is understood the President, responsive to his own wish together with complaints of Progressive Republicans, will ask Congress for the creation of new machinery. Apparently, it is proposed to create a new NRA board so as to provide better protection for small business.

Both Senator Borah and Senator Nye claim that codes for the larger business interests often create monopolies in violation of the National Recovery act. The President in giving his attention to this situation is said to be considering the setting up of an NRA board to safeguard anti-trust provisions, especially the one which says that codes "shall not promote monopolies or eliminate or oppress small enterprises." The problem has so many angles that it will require further study before action is taken. The matter of productive capacity of various units of industry and other points enter into the situation. There is the thought that the matter may be handled without legislation and that the Board, set up by Executive order, can deal with the situation through fair trade practices in codes. It is

not likely that any member of Congress would serve on the contemplated administrative agency, but that a Congressional committee might be set up at the suggestion of the President in order to keep in touch with operations of the NRA.

There is a sentiment, however, in favor of legislation to make clearer the relationship between the NRA and the anti-trust laws. Administrator Johnson has stated that there are misunderstandings in trade and industry with respect to the effect of the Recovery act and of codes approved under the act upon provisions of the anti-trust laws. He has pointed out that trade and industrial groups are not exempted from the provisions of the anti-trust laws except in so far as they are expressly authorized to act in accordance with specific provisions of a code or agreement under the act approved by the President. Arrangements among members of an industry or trade to fix or maintain prices not expressly sanctioned by an approved code, he has declared, are therefore in violation of the anti-trust laws to the same extent as before passage of the Recovery act. It is said that legislation bringing out these points may be offered as an amendment to the Recovery act.

Dodge May Exhibit New Trucks at New York

DETROIT—At the time this is written, it is almost a certainty that Dodge Brothers will come to the New York Show with new commercial cars and several important additions to its truck line. Details have not yet been released for publication. There will not be any independent springing on the Dodge commercials, but horsepower has been stepped up materially.

Commercial and truck manufacture at Dodge has been completely separated from passenger car activities. The entire truck plant has been revamped, rebuilt and retooled for this purpose.

Receiver for New Process

SYRACUSE—The New Process Gear Co. has been taken over by Clarence R. King, as receiver for the Federal Court. The order was made on petition of the National Malleable & Steel Castings Co., Cleveland.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

Trade reports indicate that the closing week of 1933 witnessed further gains in general business activity. Holiday trade in many sections was the best reported in several years. Industrial operations, despite the holidays, were well maintained.

Freight Loadings Increase

The movement of railway freight declined seasonally during the week ended Dec. 23 but remained above the level of a year ago. Loadings during that period totaled 527,067 cars, showing a decrease of 27,765 cars from the total for the preceding week but an increase of 32,557 cars over that for the corresponding period last year.

Dept. Store Sales Rise

Sales of department stores in the metropolitan area of New York from Dec. 1 to Dec. 23, inclusive, were 7 per cent larger than in the corresponding period a year ago, according to the Federal Reserve Bank of New York. The increase is partly attributable to sales by liquor departments opened by some of the stores early in the month. Exclusive of liquor sales, the increase amounted to about 4 per cent.

Power Production Largest Since September

Production of electricity by the electric light and power industry of the United States showed a further increase for the week ended Dec. 23. Output during that period was the largest for any week since September and exceeded by 6.6 per cent the total for the corresponding period last year.

Exports Firm

Exports of merchandise from the United States in November had a total value of \$184,000,000, as against \$194,000,000 in October and \$139,000,000 in November, 1932. Imports amounted to \$128,000,000, as compared with \$151,000,000 in the preceding month and \$104,000,000 a year ago.

Crude Oil Production Declines Sharply

Crude oil production declined sharply during the week ended Dec. 23 but continued to exceed the Federal allowable quota. Average daily output for that period amounted to 2,289,900 barrels, as against 2,352,950 barrels a week earlier and 2,025,700 barrels a year ago. The allowable total under the Federal code is 2,210,000 barrels daily.

Wholesale Prices Remain Firm

Professor Fisher's index of wholesale commodity prices for the week ended Dec. 29 stood at 71.8 as against 71.4 a week earlier, 72.0 two weeks earlier, a high for the year of 72.2 in October, a low of 55.0 in March, and an average of 58.5 in December, 1932.

Federal Reserve Statement

Holdings of bills and securities by the Federal Reserve banks declined \$7,000,000 during the week ended Dec. 27, with a decrease of \$4,000,000 in discounts, a decline of \$2,000,000 in bills purchased in the open market, and virtually no change in holdings of Government securities. Note circulation decreased \$1,000,000, while deposits increased \$17,000,000 and reserves \$16,000,000.

Trade Division.

Shipments of passenger cars declined from 2,428 valued at \$1,004,938 in October to 1,228 valued at \$490,358, while exports of trucks increased from 440 valued at \$161,183 to 522 valued at \$196,929.

Canadian exports of automotive parts in November of the current year were valued at \$177,935, com-

pared with \$225,378 in October and \$272,602 in November, 1932.

Shipments of all automotive products from Canada in the eleven months ending November, 1933, reached a value of \$9,098,945, a gain of 37.9 per cent over the corresponding period of 1932, when exports totaled \$6,596,115.

Model Showroom Included in New De Soto Building

DETROIT—Detroiters crowded the new De Soto-Chrysler administration building and model showroom on Dec. 30 to view the striking new building and inspect the 1934 Airflow De Soto and Chrysler cars.

The new building contains what its builders declare is the "world's model automobile showroom." It is long enough so that a prospect can actually take a demonstration in a new car at 30 miles per hour without ever leaving the showroom floor. The new building is modern in design, and closely follows the motif of the buildings of the recent A Century of Progress.

New Warehouse for Libbey-Owens-Ford

TOLEDO—Ground has been broken for construction of a new storage warehouse at the Libbey-Owens-Ford Glass Company's Rossford plant, on the outskirts of Toledo. The new structure will be built at a cost of \$250,000, it was announced by officials of the company.

New Moore Forge Officers

SPRINGFIELD, MASS. — A. H. Chapin has retired as president and treasurer of the Moore Drop Forging Co., Springfield, Mass., and has been elected chairman of the board of directors. Frank D. Fuller, formerly a vice-president, becomes president, and John M. Collins, who has also been vice-president, becomes treasurer.

Evans Appliance Co. Gets Navy Order

DETROIT—Evans Appliance Co. reports orders from the U. S. Navy for its aviation fuel pump designed for combat planes. Tests of the company's new E-8 model at the Philadelphia navy yard have been reported as satisfactory and the company anticipates further orders from this source.

Dealers Appoint J. Reed Lane as Code Authority Secretary

ST. LOUIS—J. Reed Lane, formerly assistant deputy administrator of the National Recovery Administration, has been appointed executive secretary of the National Code Authority of the Motor Vehicle Retailing Code.

Canadian Automotive Exports Decrease

WASHINGTON—Exports of motor vehicles and parts from Canada in November totaled \$865,222, compared with \$1,391,499 in October and \$906,448 in November, 1932, according to figures compiled in the Commerce Department's Automotive - Aeronautics